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BLUE JAY

September 1987

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Cover: *Trembling Aspen in fall. Blake Maybank*

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ONE HUNDRED YEARS OF LAND USE*

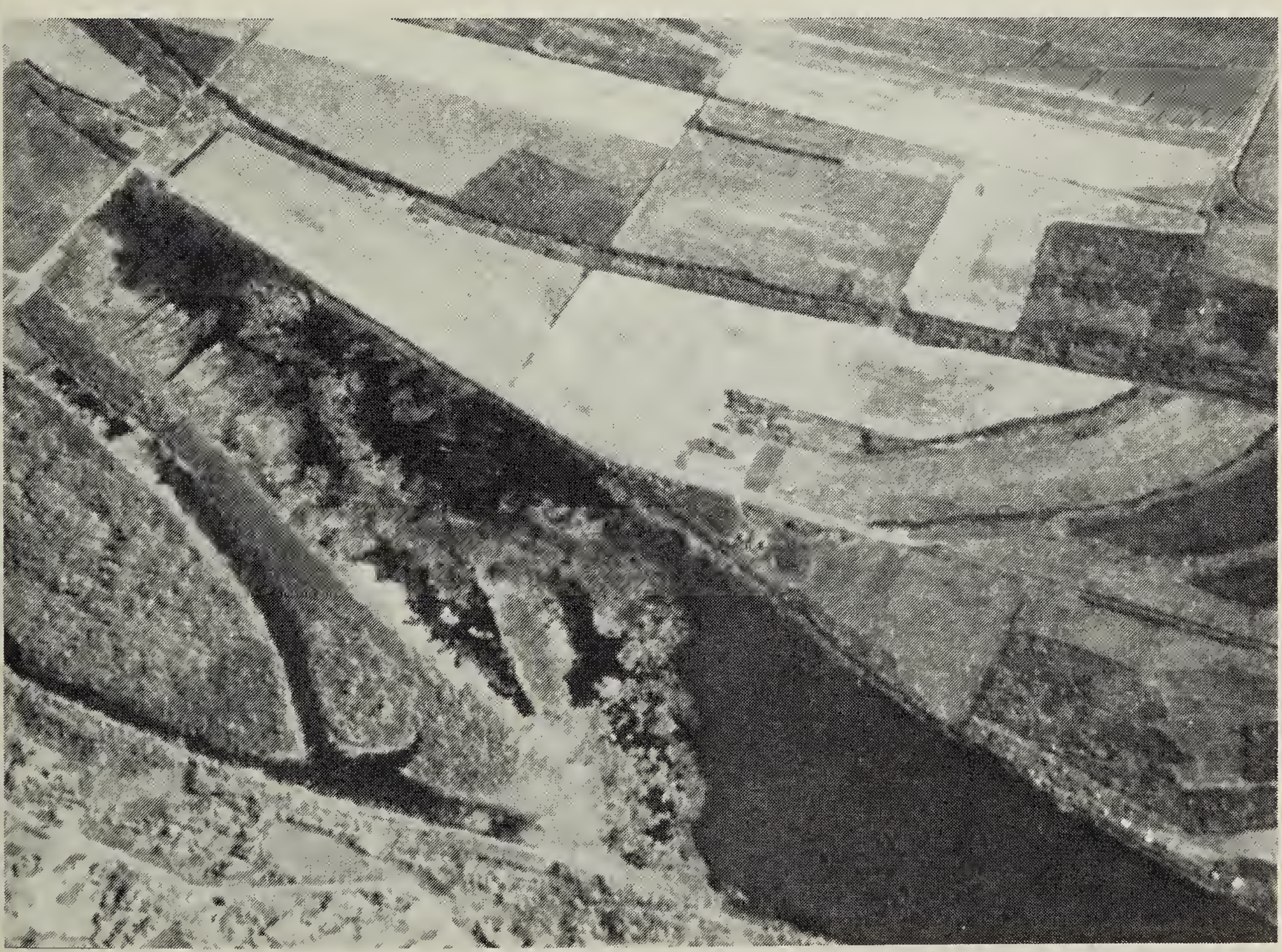
J. STAN ROWE, Crop Science and Plant Ecology Department, University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0

Little more than a century ago the shift in land use from hunting-and-gathering to agriculture was initiated on the Western Plains. Today the prairie scene is completely changed from what it was when John Macoun came botanizing by, exclaiming at the marvelous flowers while also declaring the grasslands fertile and suitable for farming. As we look out from the land rectangles that enclose us in town and country - the legacy of the cadastral grid land surveys of the 1870s and 1880s - it is difficult to imagine the curvilinear sights, sounds and smells of the primeval grasslands, now reduced to a few forlorn and untypical fragments.

Attitudes Shape Uses of Land

The land-use changes that began toward The end of the 19th century were no accident. They were the logical expression of European attitudes toward and perceptions of lands utilized by hunter-and-gatherers as nothing but wilderness, waste, barren, desert, and deserted, until colonized and "improved" for human uses. (The adjective "improved" when applied to natural landscapes tells us much about ourselves and our attitudes to nature.)

The rapidity of the land-use transition reflected a Canadian National Policy, promulgated in 1879 in response to several political urgencies. One was the perceived threat of an American expansion north of 49 degrees, to be countered by the establishment of a communication and



Aerial view at north end of Pike Lake, Sask. *J.B. Gollop* transportation system that would make possible - through settlement -the occupation of the Prairie Region. Another was the ambition to create a new and relatively exclusive market for the expanding financial and industrial productions of Eastern Canada.

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* This paper was presented to the joint annual meeting of the Canadian Nature Federation and the Saskatchewan Natural History Society held in Saskatoon, Saskatchewan in June 1987.

Railways, tariffs, and immigration were parts of the same package, aimed at contributing both to the military protection and to the economic integration of the new Dominion. And of course times were opportune to sell cereals abroad, particularly the seeds of the desert grass, wheat, because the booming industrial revolution in the Old World continued to boost the growth of urban labour forces and their demands for bread.

Prairie settlement was born into a capitalistic era of machine agriculture, and did not represent a development imposed on older village-centred feudal forms such as existed in Europe and Asia. There the constant threat of raids and of warfare, the lack of police protection and of sanitation, had encouraged rural people to cluster together in villages from which they travelled out daily or seasonally to engage in subsistence agriculture.[1] The comparative safety of Western Canada as well as the methods of allocating land to the CPR, the HBC, land corporations, individual settlers, and for schools, had the effect of scattering farmsteads, with towns subsequently appearing at grain-shipping points. The latter, 12 to 15 miles apart on the railway lines, were spaced to suit the capabilities of horse-powered transportation.

Furthermore, from the beginning and with few exceptions farming was oriented to the market, to raising food for export, for cash. Ideas of traditional subsistence farming, and of regional self-sufficiency in food, were not in the books.

The early insinuation into Prairie

Wheat *Gary W. Seib*

agriculture of the idea of farming as a commercial enterprise, as a business (and for some as a money-making means to move to the West Coast) rather than as a provisioner of healthy food for domestic consumption, lies at the root of the exploitive land uses that continue to plague the West today. For attitudes as to what farming is all about - the cultural goals of agriculture - have much to do with the way rural society is organized and with how the land is managed and conserved, or mismanaged and degraded. Attitudes have determined land use on the Prairies and only profound changes in attitudes will change, for the better, the land uses of the future.

Despite continuing rhetoric about farming as primarily a way of life, and after that a money-making enterprise, the suspicion grows that the family farm and its virtuous farming life-style is a nostalgic relic, a museum piece, at least where the majority is concerned. The Jeffersonian farmer and husbandman, self-sufficient and secure on his small holding, the bulwark of democracy because of his rugged unsubsidized independence, is long gone.[2] President Mitterand visiting Regina in the spring of 1987 defensively asserted that on the average each Canadian farmer is subsidized about $30,000 yearly.

Economic Goals Subvert Conservation

Massive industrialized production on ever-larger farms is the present goal, and development economists set the standards to which most farmers adhere, willingly or not. According to current theory, progress is gauged by productivity figures; that is, by output per person. Applied to agriculture as just another business, progress is therefore inversely related to the percentage of the population engaged directly in agriculture. Thus the fewer the farmers on the land the more advanced the economy, on the assumption that reduced employment in primary production - in farming (and in forestry, fisheries, mining) - frees up labour and capital for more worthy industrial and service pursuits in the cities.

The land use changes that have accompanied the intensified industrialization of Prairie agriculture since its beginning are well known and will only be mentioned briefly. The average size of farm has steadily increased as the percentage of rural population has decreased. Just as energy-intensive technology in the form of the tractor made horses obsolete on the land, so powerful machines for tilling, seeding, spraying and harvesting have also made people obsolete on the land. (We sold the horses for meat; we still have not figured out what to do with the excess people.) In general, mixed farming or diversified farming has not been encouraged "because of the loss of efficiency compared to specialized production," to quote a Report on Manitoba's Economic Future.[3] Thus in the attempt to coax increased production from the soil and so beat the cost/price squeeze, the landscape is more and more simplified in bigger and bigger chunks.

Unfortunately, and this is largely unrecognized, the cost/price squeeze is the heart and soul of the industrial agriculture system, both driving it and setting its priorities. Anyone with open eyes can see that the industrialization mania is a sure formula for the destruction of wetlands, the clearing of woodlands, the abuse of marginal lands, the deterioration of soils, but convention continues to intone, "Have faith and doubt not! That's Progress. That's the rule of Impersonal Market Forces - the God that none should question." And so the trends continue.

Uncultivated Lands Threatened

Is this the full story of land use over the last 100 years? Is it fair to imply that we are a non-conserving people? What about all the uncultivated land of the Prairies - the rangelands and the aspen parklands - offering the promise of a balance in uses alternative to till agriculture? Or is it, too,

Ploughing the prairie using horse power. *Archives of Sask.*

Ploughing around bushes in the parkland with early tractor. *Archives of Sask.*

Pulling stumps to clear bush in 1910. *Archives of Saskatchewan*

Bush cleared by caterpillar tractor and piled for burning. *Lorne Scott* ticketed for "improvement" by the plough?

According to Dr. R.T. Coupland, the common belief is erroneous that land not already in arable agricultural use will remain so, with such factors as stoniness, rough topography, salinity, sandiness and droughtiness guaranteeing immunity from drastic disturbance.[4] On the contrary, the Canada Land Inventory figures for Saskatchewan indicate that irremediable impediments to cultivation exist on only 5 percent of the land surface in the grassland zone.[5] Thus in theory about 95 percent of southern Saskatchewan could be tilled (including, for example, the site of the proposed Grasslands National Park) either for cereal and oil-seed crops (approximately 60 percent of the land surface) or for "improved pasture" (approximately 35 percent of the land surface). The area on which these calculations are based includes Indian Reservations and Crown Lands, but excludes provincial parks, major water bodies, and urban areas (which are small in total).

Draining wetlands *Gary W. Seib*

Quoting one agronomist, "We in the West have not yet exploited our agricultural potential to the full. There are 35 million acres of Western Canadian land in Canada Land Inventory classes 1 to 4 as yet unused."[6]

Not unexpectedly, agricultural policies have been directed toward the exploitation of the untilled areas that remain in the West. Subsidized "improvement" programs (conversion from the native state) are always popular - during prosperous times to take advantage of favorable markets, and during desperate times to provide that extra increment of production or of quota acreage that might make the difference between farm survival and failure.

Prairies Intensively Tilled

Even without this on-going attrition of native-prairie rangelands and other wildlands, the level of intensity of land use in the grassland zone of Western Canada is exceedingly high. Dr. Coupland has calculated that the unforested part of the Prairie Provinces occupies only 5 percent of the land area of Canada, but it comprises 74 percent of the country's annually cultivated land. Within this region, something over 60 percent of the land surface is at present devoted to arable (tilled) agriculture and more than 50 percent is cultivated annually. For comparison, in the most climatically comparable area of the United States, on 51 percent is in arable agriculture and 36 percent is cultivated annually. Thus the intensity of land use in the unforested region of Manitoba, Saskatchewan, and Alberta probably is not exceeded on such a grand scale anywhere else on earth.[7] Little wonder that the Prairies today have the dubious distinction of being at the centre of so many "Wildlife in Jeopardy" programs.

Northward, the Aspen Parkland with its fescue grassland is in the same predicament as the Mixedgrass Prairie zone - a patchwork of small remnant endangered ecosystems in a matrix of tilled land. In this area, already extensively exploited and simplified by agricultural use, trends are the same as in the south. Estimates of the areas surviving, compared to the original, range from a high of 20 percent to a low of 2 percent, depending on the subregions considered.[8] The fragments that remain are mostly of small size, and are increasingly important as refugia for plants and animals whose surrounding natural systems have been destroyed. A few major blocks are protected in National Parks and Military Reserves. The larger Provincial Parks, however, with few exceptions allow multiple uses such as grazing, gravel mining, oil and gas exploration and extraction, forestry, and of course various kinds and intensities of recreational use, so that the total effect is to deteriorate and decimate the type. Other tracts of public land are also exposed to multiple uses with little regard for preservation, and for example community pastures that should be managed in the public interest by the maintenance of their native biota display notorious carelessness in this regard.

To the eastward, Manitoba's Tall Grass Prairie is more than 99 percent gone, and only at this late date, 1987, has an inventory effort been mounted to locate the last few acres of what was once a rich and beautiful type.

The difficulties in obtaining a balance between agricultural and other legitimate land uses are pointed up by the almost insurmountable obstacles encountered in trying to preserve native landscapes for

Parklands and forest margins are being cleared *J.B. Gollop* their own intrinsic values. Since 1941 attempts, largely unsuccessful, have been made in Saskatchewan to protect small areas of grassland permanently for scientific purposes. Negotiations with Provincial authorities in the 1950s provided legislation that could have given permanent protection to a number of designated grasslands, but it was repealed before it was used. Again, in the 1970s, the International Biological Program generated pressure for Natural Area preservation, and one hundred representative or unique landscape tracts were proposed. A few important areas, such as the Matador Grassland, gained the protection of the Parks Act, but under the Ecological Reserves Act, on the books for nearly a decade, the province has so far managed to designate only one small parkland area on the banks of the Assiniboine River. Meanwhile 99 percent of potential Ecological Reserves on lacustrine and till plain landforms in the Grassland Region have been wiped out by the plow and the cow.

So what do we have to show for "balanced land use" - the heart of any conservation strategy - in the southern half of Saskatchewan? About one half of the "improved" land in all of Canada - 47 million acres. Area devoted to National Parks? Nothing. (Prince Albert National Park, up in the forest belt, occupies just 0.6 percent of the province.) Area devoted to Provincial Parks - 0.7 percent, about the same as in road allowances, and most of them beyond the Grassland zone. Devoted to Wildlife Areas of various kinds 1.2 percent.[9] Putting them all together, a mere 2.5 percent of the total provincial area, and much less than 2 percent if the grassland region alone is considered. This is a disgrace to the Province (equalled only by the disgrace to Canada of having a mere 1.6 percent of the nation's area in National Parks).

Grasslands - the "Failed Resource"

Partly the problem of attaching importance to natural grassland is one of perception. Neil Evernden tells the story of a trip

Jumping Deer Creek Valley nw of Lipton, Saskatchewan *Gary W. Seib* by rail across the Prairies, looking out from the dome car, while the conductor commented, "Don't know why - there's nothing to see." Evernden ironically calls the prairie "A Failed Resource" because to eyes attuned to forests and lakes, to mountain and sea, it baffles with its spatial volume and apparent emptiness; its big sky, sweep of wind, and brilliant sun that threatens "to bleach the ego." As various people have remarked, "How can there be an interesting Grassland National Park?" Henry Kelsey, one of the first white travellers on the Yellow Head Route 300 years ago, heading westward toward the Battlefords like so many tourists since, expressed the sentiment in memorable doggerel:

"This plain affords nothing but Beast and Grass, And over it in three days time we past."

Like Kelsey, the settlers of Manitoba and the Northwest Territories (from which Saskatchewan and Alberta were carved in 1905) came mostly from the milder climates of Europe and eastern North America. Grasslands to them seemed to lack an essential ingredient - trees. In his Report of the Forestry Commissioner to the Minister of the Department of the Interior in 1888, J.H. Morgan conjectured that the rich soils were treeless because of their heavy rank growth that encouraged fires.[10] Stop fires and the forests will return. He drew attention to John Macoun's 1880 report of a "desert" in southwest Saskatchewan (the Great Sandhills) where grew large cottonwoods and " a perfect oasis of nearly 700 acres surrounded by sandhills that kept out fire." Morgan recommended establishment of Experimental Forest Stations to ascertain the tree species most suitable and valuable, following which "our next duty would be the reserving of large tracts of land for permanent forests." Encouraging words such as these eventually led to the establishment of Forest Reserves at various sandhill sites in the grasslands, for example at Shilo, Elbow, and Dundurn. Although the federal government began an active farm tree-planting program in 1901 with stock provided by the Indian Head Nursery, it was not until 1916 that plantations were started on Forest Reserves. This culturally motivated attempt at an alternative land use was unsuccessful. The plantations were ravaged by drought, fire, and rabbits that showed no respect for the theories of Macoun and Morgan. In the general transfer of resources to the provinces in 1930 the federal government surrendered its sandhill forest reserves, doubtless with a secret sigh of relief. Now these sandhill lands, failed as forest producers, are cleared for pastures, grazed, and even ploughed.

Unguided Technology Leads Land Use

Technology seems to be the force that continually molds land uses. Technology's goals of efficiency and of minimizing risk appear to propel agriculture from hoe-and-sickle to horse-drawn plough and reaper, then toward the use of huge air-seeders and combines plus massive uses of chemical fertilizers, toxic biocides, and all the other techniques that go with and justify large monocultural fields. Similarly, transportation technology, another important determinant of land use, has evolved over the century from travel by horses and railroads to the automobile, airplanes, helicopters, all-terrain vehicles. Again, as with agriculture, the face of the earth is modified more and more drastically, and the changes are not friendly to the native landscapes.

Under the influence of energy-intensive technology, a third land use, mining, has moved from scraping gravel, salt, and sodium sulphate from the earth's surface to the shallow strip mining of lignite, the underground mining of bituminous coal and potash, and the deep drilling for petroleum. Each technological "advance" requires greater expenditures of fossil fuel and hydro-electric energy, and is marked by greater environmental damage.

The example of mining as a land use is particularly instructive for it shows clearly the dangers of unguided technology. Life, as we know it, evolved in the world of renewable and replenishable resources, in the post-Precambrian green world of organisms, organic soil, clean water, fresh air. The hostile environment that had existed earlier in the geological pre-life period of the earth's history was succeeded by the safer pro-life environment, screened by ozone from excessive exposure to ionizing ultraviolet rays from above, blanketed by sediments from excessive exposure to the hot radioactive rocks below. Dangerous toxic substances - heavy metals, sulfurous compounds, radionuclides, and hydrocarbons - were safely sequestered beneath the planet's surface. (These we call "non-renewable resources" and dread the day when humanity will be without them. We should call them "Unnatural Resources," mark them with a skull and cross-bones, and pray for the day when humanity will choose to do without them.)

Over the last few centuries, through mine shafts and bore holes, the technology of mining has introduced the Unnatural Resources in massive amounts back into the earth's life space, depleting the ozone layer and poisoning air, water, and soil. In a sense, mining, and the modern use of mining products, is turning the geological clock back, recreating the Precambrian environment when acid rain laced with radionuclides and heavy metals washed the soilless rocks of a hostile-to-life world. Sudbury in spades. Yet today like idiots we stand and stare at accumulating toxic wastes, at the dying fish and dying forests - clear signals to us, like the belly-up canary in the mine shaft - and ask, How can this be? Surely the technology of non-renewable resource use is good?

The precise answer is rubbish; except perhaps for a minority of mineral forms such as phosphorus and potash, two of the few life-enhancing substances dug out from underground. But even concerning

Spoil piles near Estevan, Saskatchewan *Fred Lahrman*

P and K some hard questions arise as to WHAT ON EARTH we are doing with them to our land and to our use of it. Have we any idea of how to handle in perpetuity the dangerous salt wastes that are accumulating wherever potash is mined in Saskatchewan?

Technology seems to have a life of its own, forcing its mechanical, non-organic efficiencies on the landscape, destroying in the process the world's wildness that more and more people are recognizing as priceless. Yet technology comprises human inventions, susceptible to guidance once goals are clearly defined. In the case of mining, for example, a better goal would be the extraction and use of those surface earth minerals and substances to which evolving life has long been exposed. An industrial world based on safe ceramics is preferable to the dangerous one we seem bent on reinventing.

Similarly with agriculture; are the goals toward which our land uses incline reasonable and life-enhancing? In a world awash with wheat and canola, will we continue to add to the surplus, depreciating what remains of the fertility and beauty of Prairie landscapes, subsidizing with cheap grain the misuse of land in receiving countries?

Concepts and Attitudes to Guide Land Use

Problems with land use are to a large extent the reflection of failed values, attitudes, concepts, which the inertia of technology perpetuates. One hundred years of land use on the single track of high agricultural productivity will not be side-switched, let alone reversed, without radical changes in the underlying motive forces. Let me briefly mention two related ideas, conceptual and attitudinal, whose absence hurts the land and whose presence could bring a more balanced perspective to land use in Canada and everywhere in the world.

The missing concept is the ecological one of landscapes-as-ecosystems, literally "home systems," within which organisms, including people, exist. The realities of the world are not organisms in a vague environment but the ecosphere with its sectoral landscapes and waterscapes of which organisms are just some of the vital parts. As conservationists and preservationists we spend too much effort on threatened species, as if (next to us of course) they are the only important things on God's Green Earth. True the importance of preserving "habitats" is more and more recognized as essential to the species which cannot exist without them, but "habitat" like "environment" is a weak and woolly concept that has failed to project to the public the sense of importance of the enveloping natural world and the urgency of protecting it.

The task as I see it is to begin to think ecosystems, from the BIG ONE shown in satellite pictures - the Ecosphere, the Home-Sphere - down to the small landscapes that it comprises; those that regionally and locally support all existence. These enfolding land-and-water systems, used and abused by humanity, are more than resources; they are part of the miraculous world ecosystem that brought life into being, sustains it, and renews it.

The missing attitude is sympathy with and care for the land and water ecosystems that support life. This can only come of course after we have conceived landscapes as real three-dimensional things to be valued, and have recognized their importance within the educational system. Human beings, incorrigibly homocentric, species-centred, have difficulty conceiving that things other than themselves (with the exception of some look-alike animals) merit compassionate attention.

Even in the big-sky West, the sun has not sufficiently bleached the collective

Killdeer area of proposed Grasslands National Park *Frank Bellamy*

ego. Yet here if anywhere humans should clearly see their roots in the land, understanding that they are from the land, and belong to it in a way that it can never belong to them. This realization sets the foundation for the Land Ethic that Aldo

Leopold preached as essential for humanity's salvation. The land, he said, is not a commodity that belongs to us; it is a community to which we belong.

To repeat my central message, instead of endangered species we should be focussing on endangered landscapes-as-ecosystems. The emphasis on rare and threatened animals and plants misleads the public into believing that bigger and better zoos and botanical gardens, gene banks and seed banks, can fill the need. We would not be worrying today about Swift Foxes, and the last four Greater Prairie Chicken in southern Saskatchewan, if years ago we had done some constructive worrying about the massive plough-down of native landscapes.

I have a proposition to which I hope you will all subscribe: that we petition our provincial and federal governments to change the mission and name of their Wildlife Services to Wildland Services. The CWS would still be here, but with its horizons expanded to more important entities than birds and mammals, After all, on the day the last patch of Wildland disappears all concerns for Wildlife except those of nostalgia will also vanish.

One hundred years of land use in Western Canada is prompting people to change their ways. Hopeful signs are the many different conservation and preservation programs supported by government agencies and by NGOs [non-government organizations]. After years of inaction, they all sound so good! Let us, however, remember as we support them that without concurrent conceptual and attitudinal changes, these and all such conservation programs will prove to be only stop-gap measures, finger-in-the-dike exercises, glimmerings of hope, but not the new day dawning.

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[5] SHIELDS, J.A., H.P.W. ROSTAD, and J.S. CLAYTON 1970. Inventory of Saskatchewan soils and their capability for agricultural use. A.R.D.A. Publ. M13, Sask. Inst. of Pedology, Univ. of Saskatchewan, Saskatoon.

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[9] RUMP, P.C. and K. HARPER 1980. Land use in Saskatchewan. Second Ed. Policy, Planning and Research Branch, Saskatchewan Environment, Regina. 185 pp.

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NOTE: Additional wildlife lands have been designated by interdepartmental agreements since 1980, but their permanency as fully protected lands is doubtful. Further, provincial parks are questionable sanctuaries for native landscapes and their biota, for they are managed under the rubric "multiple use" which all too often translates into "anything goes."

COLLECTION OF FOSSIL VERTEBRATES FOR THE SASKATCHEWAN MUSEUM OF NATURAL HISTORY, 1986

TIM T. TOKARYK, Earth Sciences Program, Saskatchewan Museum of Natural History, Wascana Park, Regina, Saskatchewan. S4P 3V7

During 1986 the staff members of the museum prospected several areas previously inspected and a few not reported on for a number of years (permit 86-3P).

In early July Dr. John Storer and I were in the Shaunavon area to wash additional sediments from our Late Cretaceous (65 million years ago) mammal locality (SMNH Loc. 72F08-0012) and to prospect more of the Frenchman River Valley area.[1] Before this a brief stop was made at Old Man on His Back Plateau (SMNH Loc. 72F03-0004) south of Robsart which had previously been reported on for its fossils in 1950 and 1961.[2] [3] The exposures there were still visible and a number of fossils were collected from these Frenchman Formation sediments. One of the specimens collected is an abnormally large (for its time) marsupial partial mandible. Mammalian remains from the "Age of Dinosaurs" are not commonly found, mostly because of their diminutive size; the recovery of this specimen sparked interest even more. This digression from the collection objective was brief, and we collected two burlap sacks full of surface matrix to be microscopically picked later at the Museum.

A week was spent at the "Gryde" locality carrying matrix to the truck to be transported to the Frenchman River for soaking and washing. This material will take about a year to process and study.

Several trips were made to the Unity area mostly to give tours to high school students under the supervision of Mr. Bob Eltom, and to staff members of the Tyrrell Museum of Palaeontology (Drumheller, Alberta), including the director Dr. Emlyn Koster and Drs. Philip J. Currie and Dennis Brahman. Nothing articulate or spectacular was found in these sediments (70 to 75 million years old) though a few small theropod elements were collected. Identification of these and other specimens will add to the local fauna.

In early August Dr. John Storer escorted Dr. Donald Prothero of Occidental College, Los Angeles, into the Lac Pelletier area to conduct paleomagnetic sampling. This research should, if it turns out successfully, assist greatly in a more precise dating of vertebrate fauna found in the area. The present assignment is the Late Eocene (about 38-40 million years ago).

In early September Dr. Storer, Marilyn Laframboise, Don Jeffrey and I were in Morgan Creek Badlands (also known as Killdeer Badlands) to collect additional remains of vertebrates from the Frenchman Formation. An unpublished report by Dr. Dale Russell of the National Museum of Natural Sciences (Ottawa) roughly sketches the fossil potential of the area.[4] Though geographically small (only 2.5 square miles) the area has many exposures. A week of introduction to these badlands was to be followed up in succeeding field seasons, but uncooperative weather kept us in camp except for about a day and a half of reasonable prospecting. There were a number of fossiliferous localities including one which yielded the carapace and plastron of a turtle presently referred to *Basilemys* (SMNH Loc. 72G02-0027). A return trip was made in October to collect this specimen.

Dr. Storer, Kathy Thomas and I succeeded in relocating a fossil fish site on the Carrot River north of Arborfield (first collected by Bruce McCorquodale and Albert Swanston, both then with the Saskatchewan Museum of Natural History in 1959; SMNH Loc. 63E04-0001). A number of interesting selachians (sharks, skates and rays) were collected. Specimens from both 1959 and 1986 field trips are currently being studied by both Gerald Case of Jersey City, New Jersey, and me. Though the specific age is presently uncertain they occur in sediments from the Late Cretaceous (about 95 to 65 million years ago) and will be most useful in extending geographic ranges of known selachians and possibly adding new taxa previously unknown to science.

With the redevelopment of the Lower Gallery of the Museum only a few short trips may be possible during the summer of 1987.

[1] TOKARYK, T.T. 1986. Collection of fossil vertebrates for the Saskatchewan Museum of Natural History, 1985. *Blue* Jay 44(3):150-152.

[2] FURNIVAL, G.M. 1950. Cypress Hills Map-area, Saskatchewan. Geological Survey of Canada, Memoir 242:161.

[3] HUDSON, J.H. 1961. An odd corner of the province — Old Man On His Back Plateau. *Blue Jay* 19(3):140-141.

[4] RUSSELL, D.A. n.d. A paleontological evaluation of Morgan Creek Badlands, Saskatchewan. Unpublished.

Don Jeffrey (left), John Storer and Marilyn Laframboise at our camp in the Morgan Creek Badlands.

PROLIFIC FLOWERING YEAR FOR PLAINS ROUGH FESCUE AT THE KERNEN PRAIRIE

KENNETH TOYNBEE, Department of Crop Science and Plant Ecology, University of Saskatchewan, Saskatoon, Saskatchewan. S7N 0W0

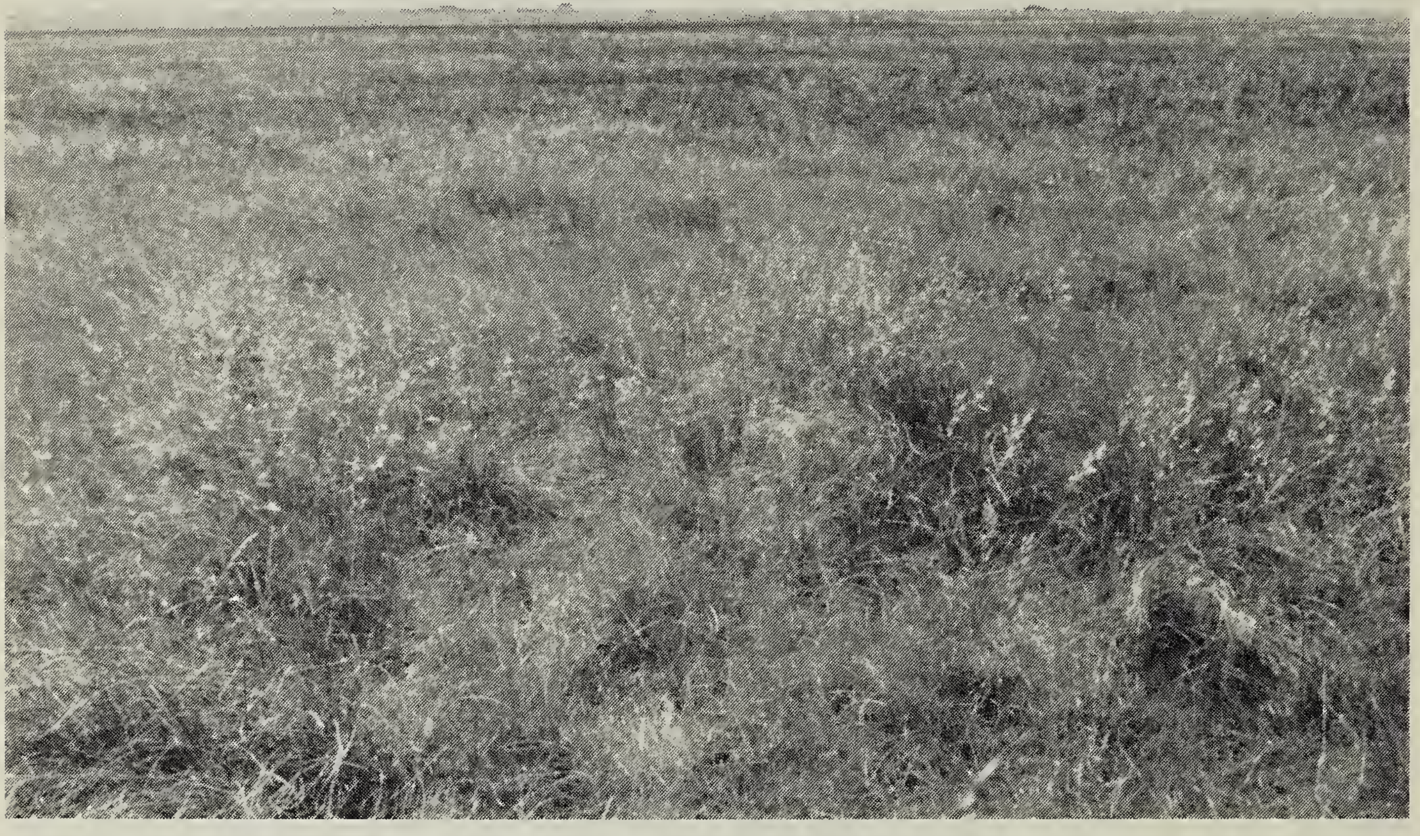

Figure 1. *Plains Rough Fescue in flower at Kernen Prairie* *Kenneth Toynbee*

Plains Rough Fescue (*Festuca altaica* Trin. ssp. *hallii* (Vasey) Harms) is the dominant grass of the fescue grassland of Saskatchewan.[1] Flowering and seed set are relatively uncommon in this perennial grass. Johnston and MacDonald reported that ungrazed fescue in southern Alberta produced a good seed crop in 1902, 1952, 1964 and 1966 and a poor crop in 1965 and 1967.[2] Moss noted that John Macoun, an early botanist, had failed to record Plains Rough Fescue in the aspen parkland in the 1880s.[3] [5] He considered Western Porcupine Grass (*Stipa spartea* var. *curtiseta*) to be the dominant species of the area. Perhaps the typically small number of seed heads present, if any may explain Macoun's omission of Plains Rough Fescue, as well as the failure to recognize the fescue association in early grassland community classifications.[1] [5]

At the Kernen Prairie natural area, a 130 ha grassland dominated by Plains Rough Fescue near Saskatoon, vigorous flowering was observed in 1987 (Fig. 1). Flowering was initiated around 10 May 1987 for a large number of fescue plants over the entire grassland, especially in unburned portions (Table 1). Flowering lasted from about 25 May until 7 June. Numbers of seed heads were counted on 30 quadrats

Table 1. DENSITY OF SEED HEADS FOR PLAINS ROUGH FESCUE AT KERNEN PRAIRIE, SASKATCHEWAN.*

Treatment	*Seed heads/m²*	
	Mean	*Standard Deviation*
Unburned	224	4.66
Fall 1986 burn	112	5.21
Early (27 April) spring burn	24	8.90
Late (6 May) spring burn	3	0.54

* Counts of seed heads were made in early June 1987 on 30 quadrats 25 cm square11

25 cm square, on different treatments of unburned and fall or spring burned.

Plant ecologists and botanists familiar with the area reported that they had not observed this plant flowering so prolifically in the past.[6] Documentation of this flowering will help determine future flowering intervals, and will help to determine what controls flowering in this grass species. Production of new individuals through seed production allows hybridization to occur which can increase the gene pool of the species, a factor which may enhance that species' survival.

Johnston and MacDonald found that the vegetative apices of rough fescue appeared to initiate floral primordia in late August to early September.[2] The mild Saskatoon winter and spring of 1986-87 may have been a factor in the increased survival of the floral primordia and subsequent floral development. They also found that heading occurred in late June when the soil temperature at a 20 cm depth reached 12.7° C.[2] The warmer than normal spring weather may have brought the soil temperature to 12.7 earlier than normal. Another factor might have been the low frequency of killing frosts during the spring.

Table 1 illustrates that burning reduced the density of inflorescences. Both spring and fall burning disrupted the flowering; the spring burns caused the most detrimental effect. In this case it appears that the high temperatures during the fires may have killed many floral primordia, thereby reducing flowering.

Although there is abundant floral development, not all the flowers may produce viable seed. Preliminary sampling on 22 June showed most spikelets at the milk stage of seed development, indicating that the plants are producing seed. Further observations will be carried out to determine seed productivity and viability.

Acknowledgements

The constructive comments from A. Schwarz, B. Pylypec, R.E. Redman, V.L. Harms and J. Romo in reviewing the manuscript are appreciated.

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[1] COUPLAND. R.T. and T.C. BRAYSHAW 1953. The fescue grassland in Saskatchewan. *Ecology* 34:386-405.

[2] JOHNSTON, A. and M.D. MacDONALD 1967. Floral initiation and seed production in *Festuca scabrella* Torr. *Can. J. Plant Science* 47:577-583.

[3] MACOUN, J. 1882. Manitoba and the Great North-west. World Publ. Co., Guelph, Ont.

[4] MOSS, E.H. 1932. The vegetation of Alberta. 1V. The poplar association and related vegetation of central Alberta. *J. Ecol.* 20: 380-415.

[5] MOSS, E.H. 1955. The vegetation of Alberta. *Bot. Rev.* 21:493-567.

[6] PYLYPEC, B. 1986. The Kernen Prairie - A relict fescue grassland near Saskatoon, Saskatchewan. *Blue Jay* 44:222-231.

PHENOXY INDUCED FASCIATION

DALE SPEIRS, Box 6830, Station D, Calgary, Alberta. T2P 2E7

In the December 1986 issue of *Blue Jay* Hruska discusses some unusual growth patterns in Black-eyed Susan (*Rudbeckia hirta*) and wonders if the cause is genetic or environmetal. I would suggest that the clump of Black-eyed Susan which is illustrated has been hit by spray drift, most likely 2,4-D or MCPA.

Monstrous growths are usually either ascidate or cristate. An ascidate growth is one where the leaf or stem rolls up into a cylindrical form or terminates in a cup shape. Cristate growths are flattened, and result when the meristem or apex of the plant spreads out into a line instead of the usual pinpoint. Fasciation is illustrated in Fig. 1. The stem grows as a flat structure and often curves and twists in fantastic shapes.

Phenoxy herbicides such as 2,4-D or MCPA cause the target plants to grow themselves to death. The affected plants grow so fast that tissues and cells do not properly separate and develop as they should. While it is possible for viruses or mycoplasmas to cause this effect numerous specimens analyzed in the past were always negative for microbes. On the other hand, some specimens were checked for 2,4-D and related phenoxy herbicides, and the presence of these chemicals was seen in trace quantities. The difficulty in finding te causal agent is that by the time most specimens are noted and collected the causal agent has disappeared through natural processes. A severe hit of phenoxy herbicide will kill a plant; a minor hit will not be noticed. In between there is a range of possibilities and the right concentration of spray drift can distort growth without actually killing the plant. This is particularly obvious in woody plants where normal growth suddenly alters to fasciated growth but returns to normal in the following season. A virus or mycoplasma would continue to affect the growth of subsequent years, but if only one year's growth is affected then the cause is most likely some chemical.

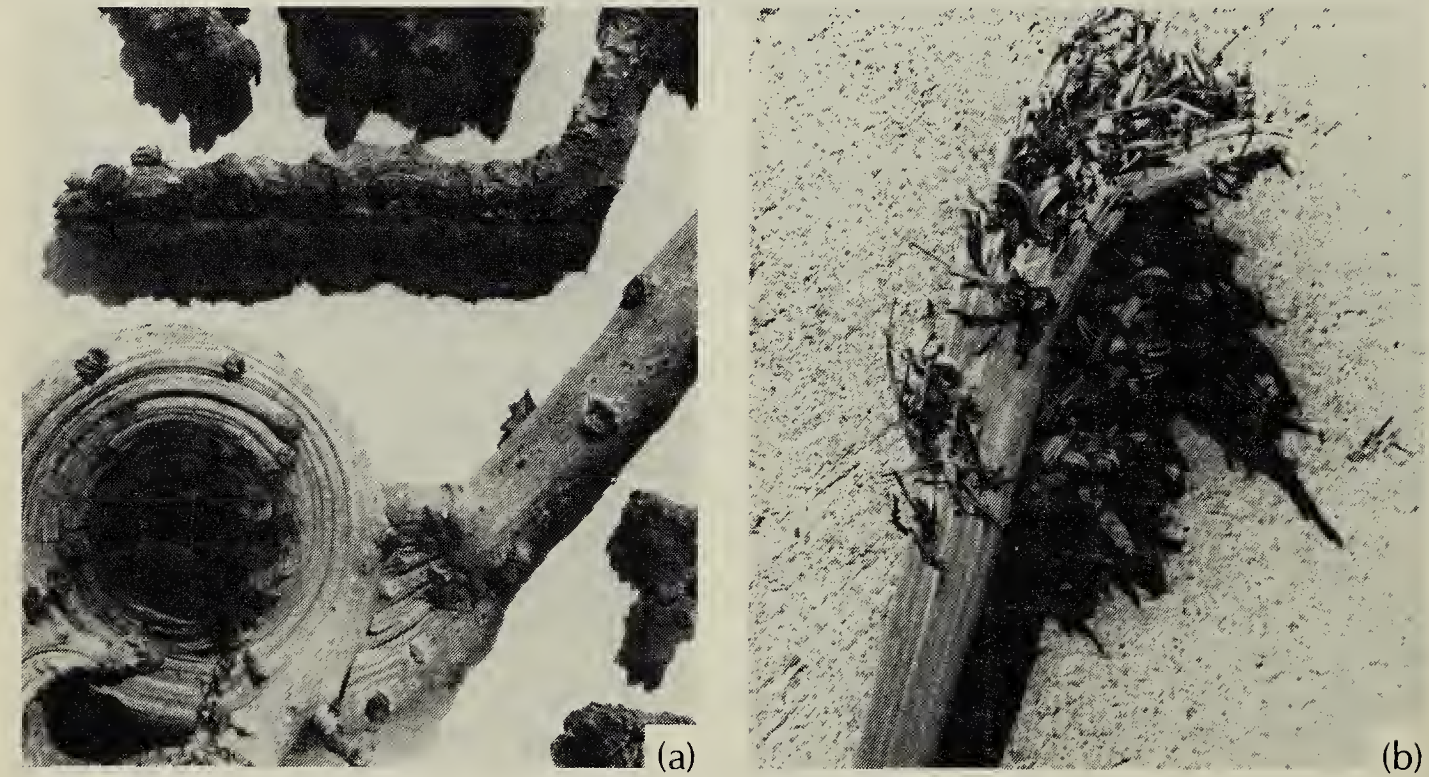


Figure 1. *Fasciation on stems of (a) Green Ash and (b) lilac*

THE STICKY GROUNDSEL AT THE PAS, MANITOBA

WALTER KRIVDA, Box 864, The Pas, Manitoba. R9A 1K8

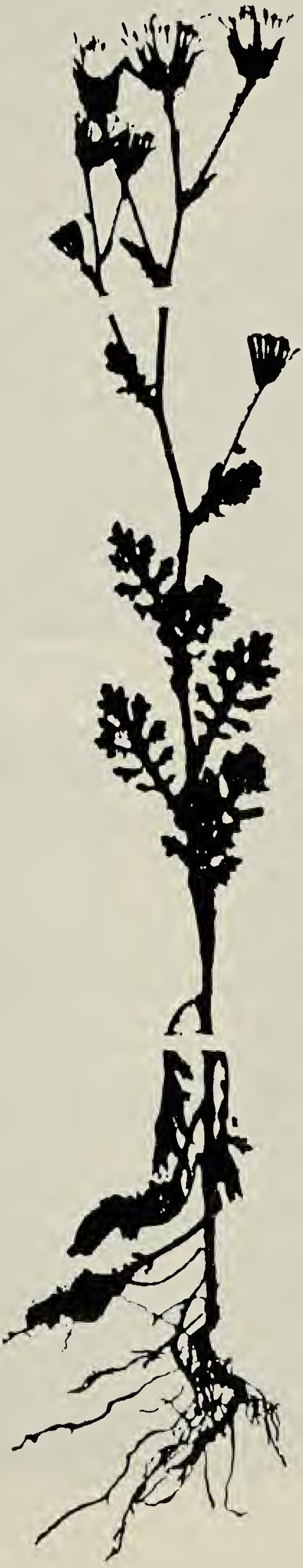
In routine collecting along railway tracks over the past few years to monitor new plants arriving here the Sticky Groundsel (*Senecio viscosus* L.) was collected. It first appeared in the late 1970s in thousands along the railway track in gravel and cinders not far from the C.N.R. station.

It has decreased in numbers progressively over the past 9 years. Only four specimens were found in the gravel and cinders in 1986. It may prove to be a weed species that failed to survive its attempt at invading this area.

This plant occurs sparingly in Winnipeg along railway tracks near the Museum of Man and Nature and in the warehouse district of north end Winnipeg. Various Winnipeg records are preserved in the Krivda Herbarium at The Pas. This species makes its home in Eastern Europe — the Balkans, and was introduced into the warehouse district of Winnipeg many years ago. [*Flora Europaea*, Vol. 4, p. 204, gives its range "From the Netherlands and N.C. Russia southwards to C. Spain and Greece, but absent from most of the south-east; recently naturalized in parts of N. and W. Europe." — *Ed.*]

The appearance of Stickly Groundsel at The Pas was wholly unexpected. Its survival for almost 10 years was also a surprise. Our climate appears to be unsuited to it.

ADDENDUM: In 1987 hundreds of plants were again present. The long season enabled them to set seed. A collection of different growth stages was made. The Common Ragwort *(Senecio vulgaris)* grew with The Sticky Groundsel. Possibly hybridization will occur. The Common Ragwort can be told from Sticky Groundsel by the hairy leaves of the latter. — W.K.



A CHECK-LIST OF THE MOTHS OF SASKATCHEWAN

PART 1 - TENT CATERPILLARS, SILK MOTHS AND SPHINX MOTHS

RONALD R. HOOPER, Box 757, Fort Qu'Appelle, Saskatchewan. S0G 1S0

There are between 1500 and 2000 species of moths in Saskatchewan. This series will cover the major families of larger moths. Abbreviations are used in the text for directions (n north, s south, e east, w west) and size (mm millimetres, cm centimetres).

Tent Caterpillars (Lasiocampidae)

These moths are called Tent Caterpillars because the larvae of some of the species live in silken tents. Most people of the prairies and parklands are familiar with the tents of the Prairie Tent Caterpillars on Choke-cherry bushes. The Forest Tent Caterpillars live in colonies, but they do not spin silken tents; they often defoliate whole bluffs of aspen. Our friends that help keep them in control are Black-billed Cuckoos and ground beetles called Caterpillar Hunters.

Adult moths of this family are mostly rusty coloured and from 25 to 30 mm in wing expanse.

MACROMPHALIINAE

Larch Lappet Moth - *Tolype laricis* (Fitch) — Shoal Lake

GASTROPACHINAE

Small Lappet - *Phyllodesma (Epicnaptera) americana* (Harr.) — s Sask., n to Sturgeon Landing and Otter Rapids

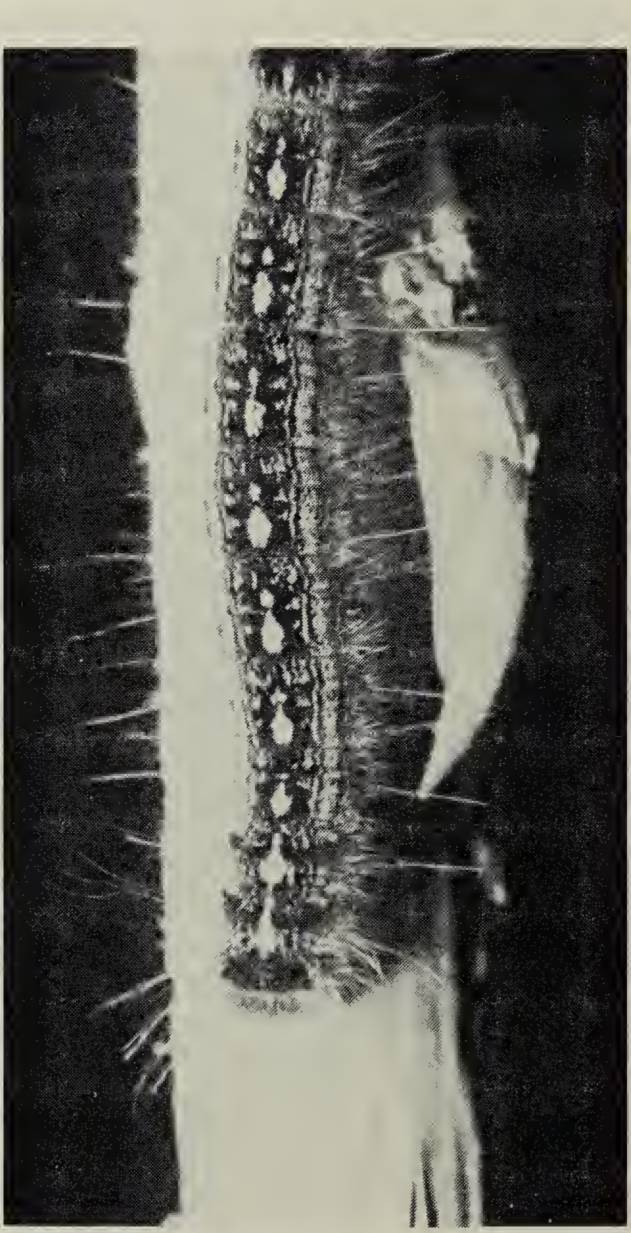
LASIOCAMPINAE

Forest Tent Caterpillar - *Malacosoma disstria* Hbn. — Throughout Sask.

Eastern Tent Caterpillar - *M. americanum* (F.) — s Sask., n to Indian Head and Elbow

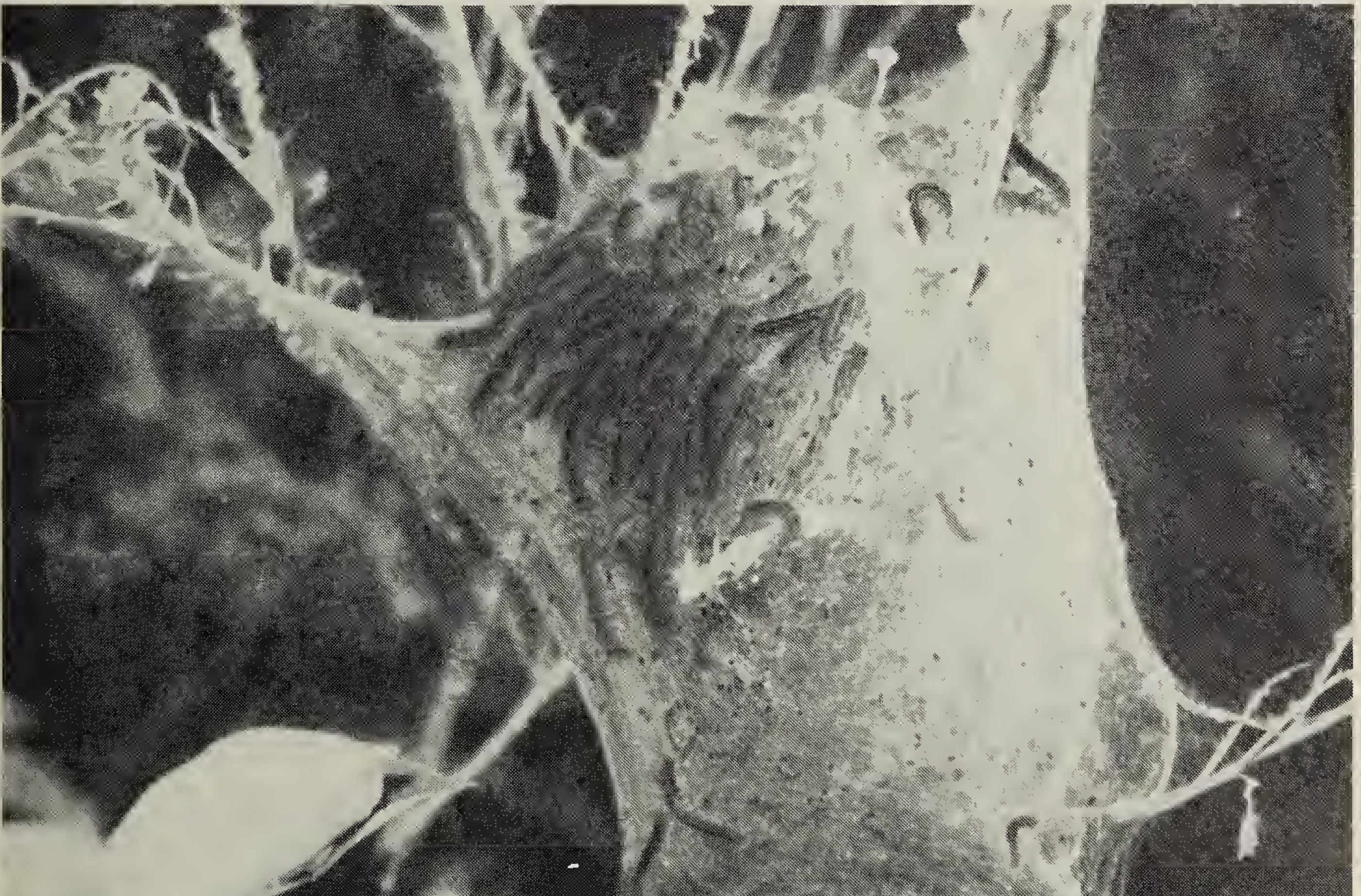
Western Tent Caterpillar - *M. californicum pluviale* (Dyar) — n Sask., s to Kamsack and Kyle

Prairie Tent Caterpillar - *M. californicum lutescens* (N. & D.) — s Sask., n to Foster Lake

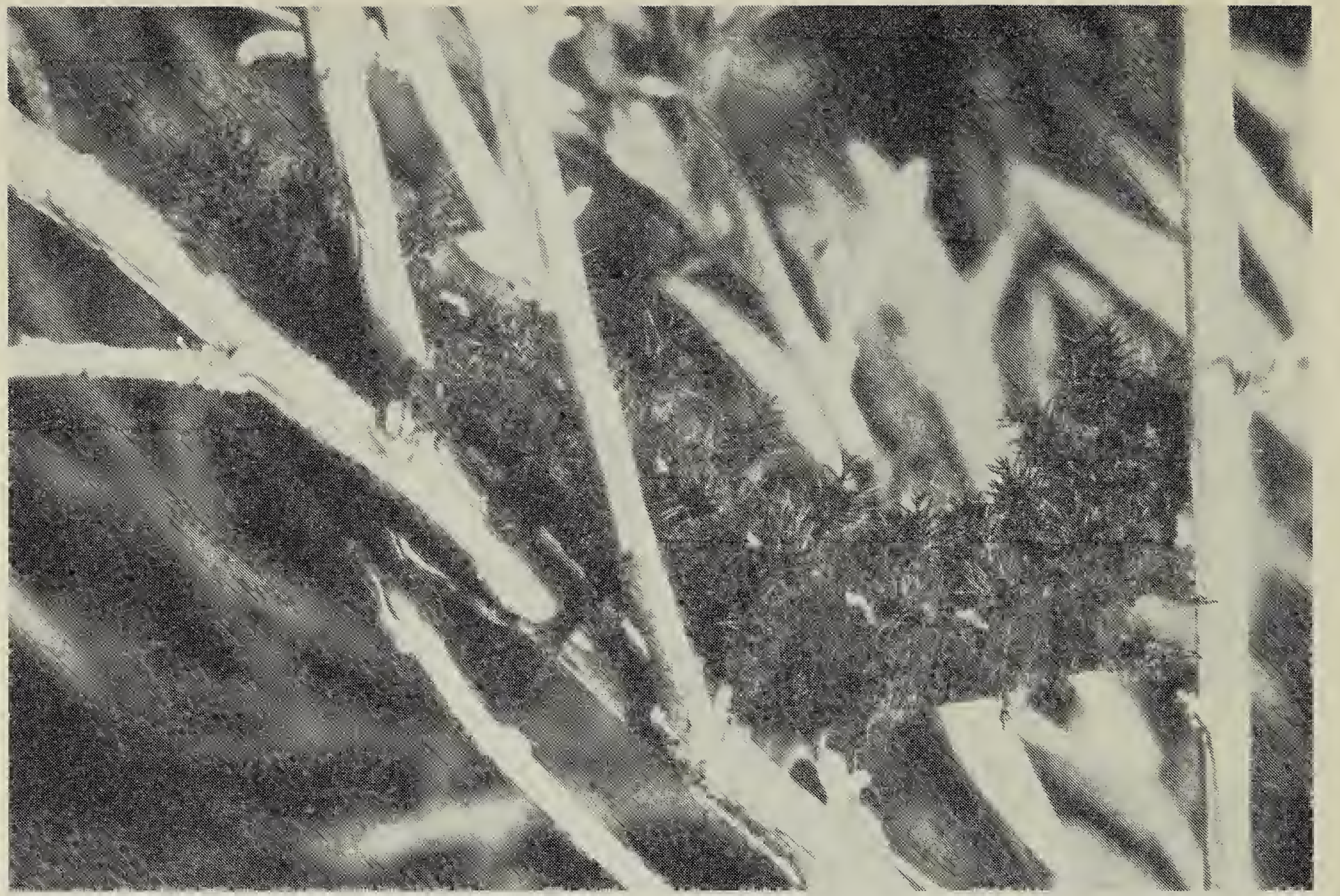


Forest Tent Caterpillar *R. Hooper*

Prairie Tent Caterpillar

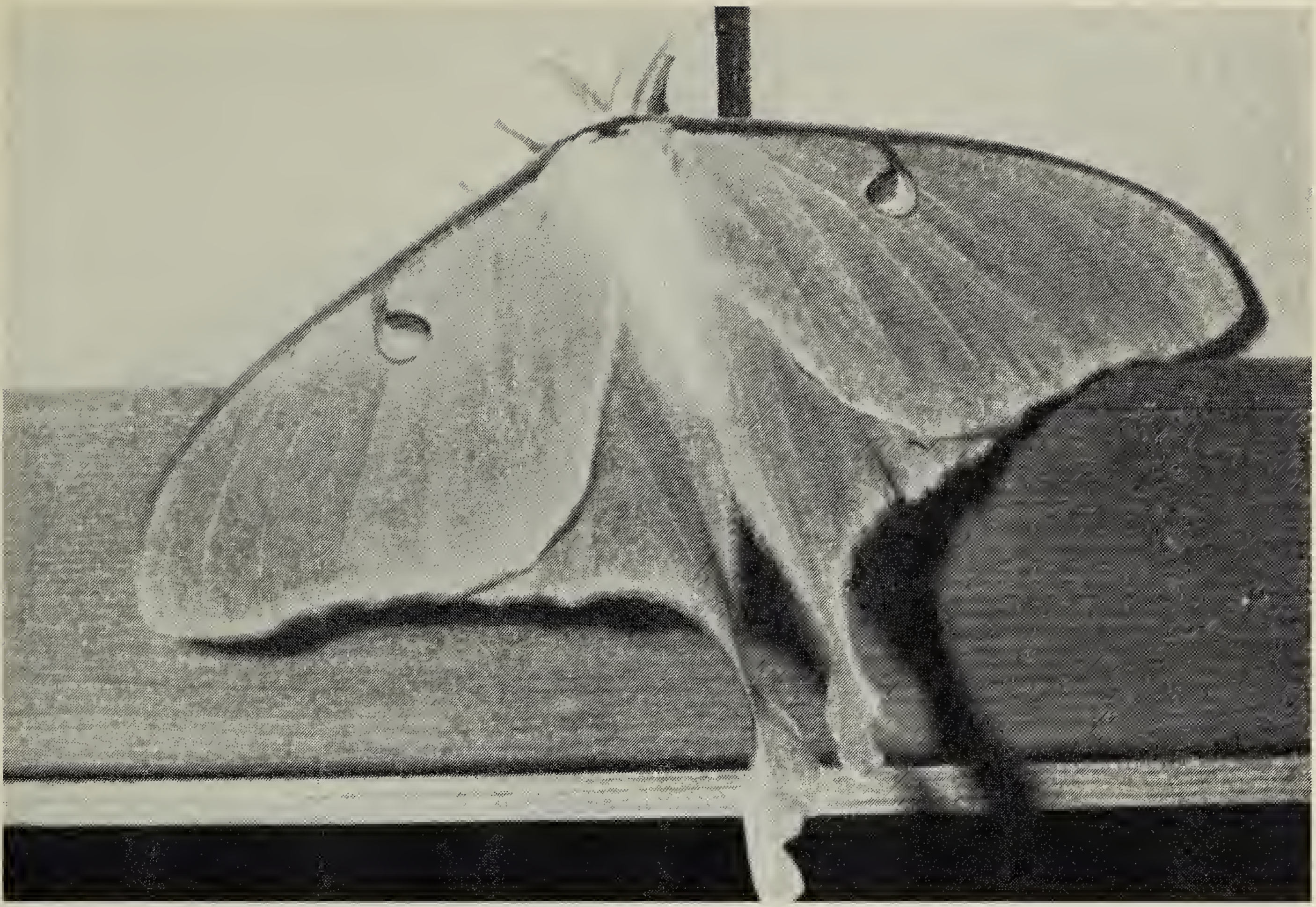


Tent Caterpillars



Sagebrush Sheep Moth Caterpillar *R. Hooper*

Polyphemus Silk Moth, Maryfield, Saskatchewan *R. Hooper*



Luna Moth, Moose Mountain Provincial Park *K.N. Roney*

Giant Silk Moths (Saturniidae)

This family is called Silk Moths for the large silken cocoons that the larvae spin, but their silk is not used for commercial purposes as the Silk Moth from Asia.

The Cecropia Moth is our largest moth that is raised in this province (although we do have two larger species of Owlet Moths that come here as strays).

The caterpillars are large and bulky and they need to be for they do all their feeding in the larval stage because the adults have no mouth parts. The adults are therefore quite short-lived.

To enable the males to find the females by scent more readily they have large feather-like antennae. Each wing of a Giant Silk Moth has a round or crescent-shaped "window" which is actually a false eye.

HEMILEUCINAE

Buck Moth - *Hemileuca nevadensis* Stretch — Indian Head and North Battleford

Sagebrush Sheep-moth - *H. hera* (Harr.) — Killdeer Badlands, Val Marie and Govenlock

SATURNIINAE

Polyphemus Silk Moth - *Antheraea polyphemus* (Cram.) — s Sask., n to Sturgeon Landing and Otter Rapids

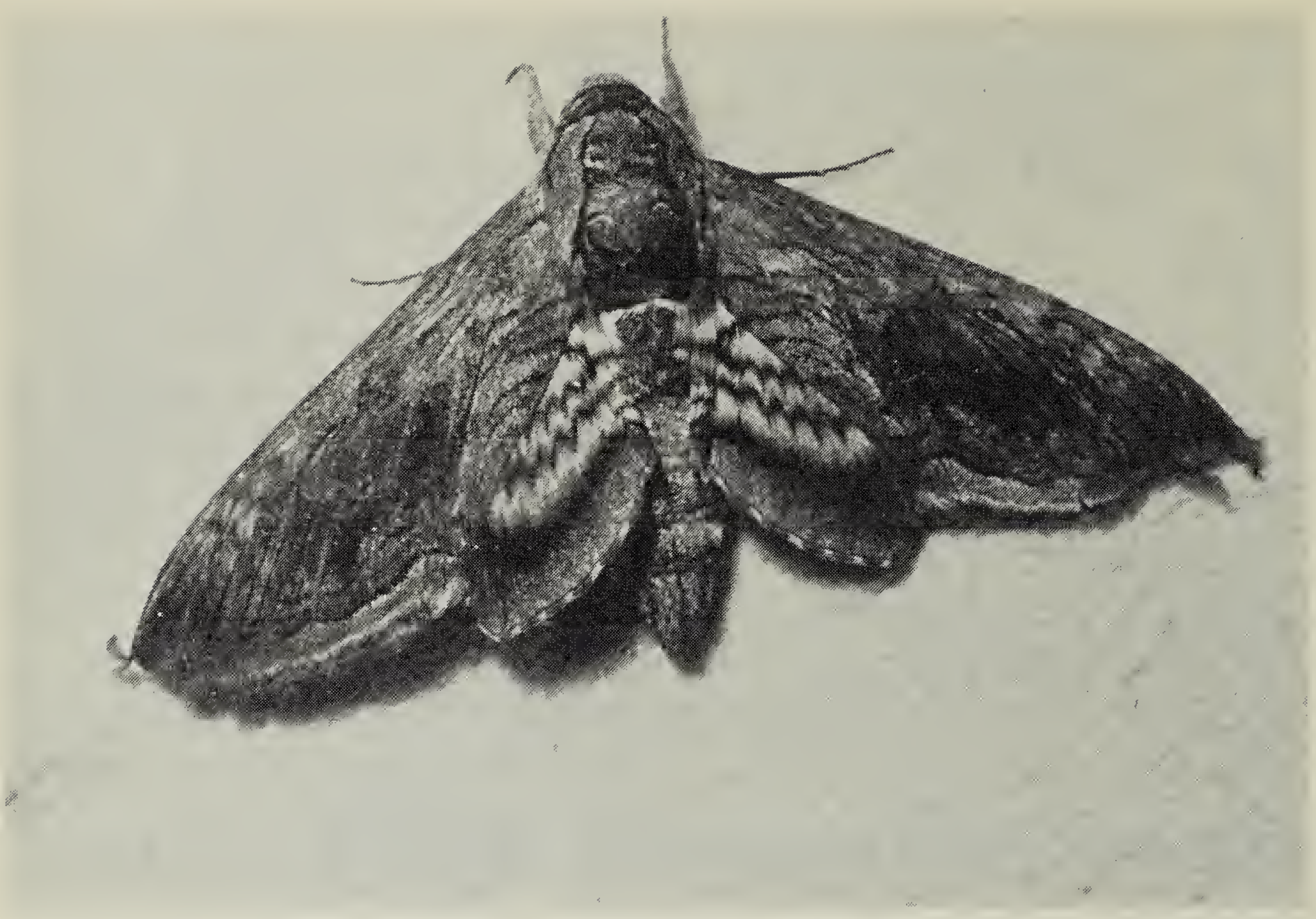
Luna Moth - *Actias luna* (L.) - e Sask., w to Weyburn, Saskatoon, n to Pasquia Hills, Nipawin and Prince Albert

Cecropia Moth - *Hyalophora cecropia* (L.) — s Sask., n to Hudson Bay, Candle Lake and North Battleford

Glover's Silk Moth - *H. gloveri* (Stkr.) — s Sask., n to Deschambault Lake and Meadow Lake Park

EXPECTED SPECIES

Manitoba Oakworm Moth - *Anisota*



Tomato Hornworm *Richard Fyfe*

manitobensis McD. — has been taken west to Aweme and Shoal Lake, Man.

Pink-striped Oakworm Moth - *Anisota virginiensis* (Drury) — has been taken west to Shoal Lake, Man.

Sphinx Moths (Sphingidae)

Sphinx moth caterpillars and pupae are recognized by the horn on the tail. The adult moths are recognized by their relatively large sized bodies and the long narrow fore-wings.

SPHINGINAE

Tomato Hornworm - *Manduca quinquemaculata* (Haw.) — Melville and Kindersley

Elm Sphinx - *Ceratomia amyntor* (Geyer) — s Sask., n to Fort Qu'Appelle and North Battleford

Waved Sphinx - *C. undulosa* (Wlk.) — s Sask., n to Pasquia Hills and Prince Albert

Great Ash Sphinx - *Sphinx chersis* (Hbn.) — s Sask., n to Stockholm, Fort Qu'Appelle and Saskatchewan Landing

Vashti Sphinx - *S. vashti* Stkr. — s Sask., n to Kamsack, Bjorkdale and Meadow Lake Park

Laurel Sphinx - *S. kalmiae* J.E. Smith — Indian Head

Gordian Sphinx - *S. gordius* Cram. - n Sask., s to Fort Qu'Appelle

Clemen's Hawkmoth - *S. luscitiosa* Clem. — Tantallon, Somme, Bjorkdale and Loon Lake

Wild Cherry Sphinx - *S. drupiferarum* J.E. Smith — Maryfield, Fort Qu'Appelle, Punnichy and Douglas Park

Bombyx Sphinx - *Lapara bombycoides* Wlk. — Nipawin Provincial Park, Prince Albert and Loon Lake

Vashti Sphinx Moth, Maryfield, Saskatchewan *R. Hooper*

Twin-spot Sphinx - *Smerinthus jamaicensis* (Drury) — s Sask., n to Sturgeon Landing, Otter Rapids and Clearwater River

Cerisy's Sphinx - *S. cerisyi* Kirby — s Sask., n to Sturgeon Landing, La Ronge and Lloyd Lake

Blinded Sphinx - *Paonias excaecatus* (Smith) — s Sask., n to Somme and Prince Albert

Small-eyed Sphinx - *P. myops* (J.E. Smith) — s Sask., n to Somme and Bjorkdale

Big Poplar Sphinx - *Pachysphinx modesta* (Harr.) — s Sask., n to Sturgeon Landing and Lake Athabasca

MACROGLOSSINAE
Hummingbird Clearwing - *Hemaris thysbe* (F.) — throughout Sask.

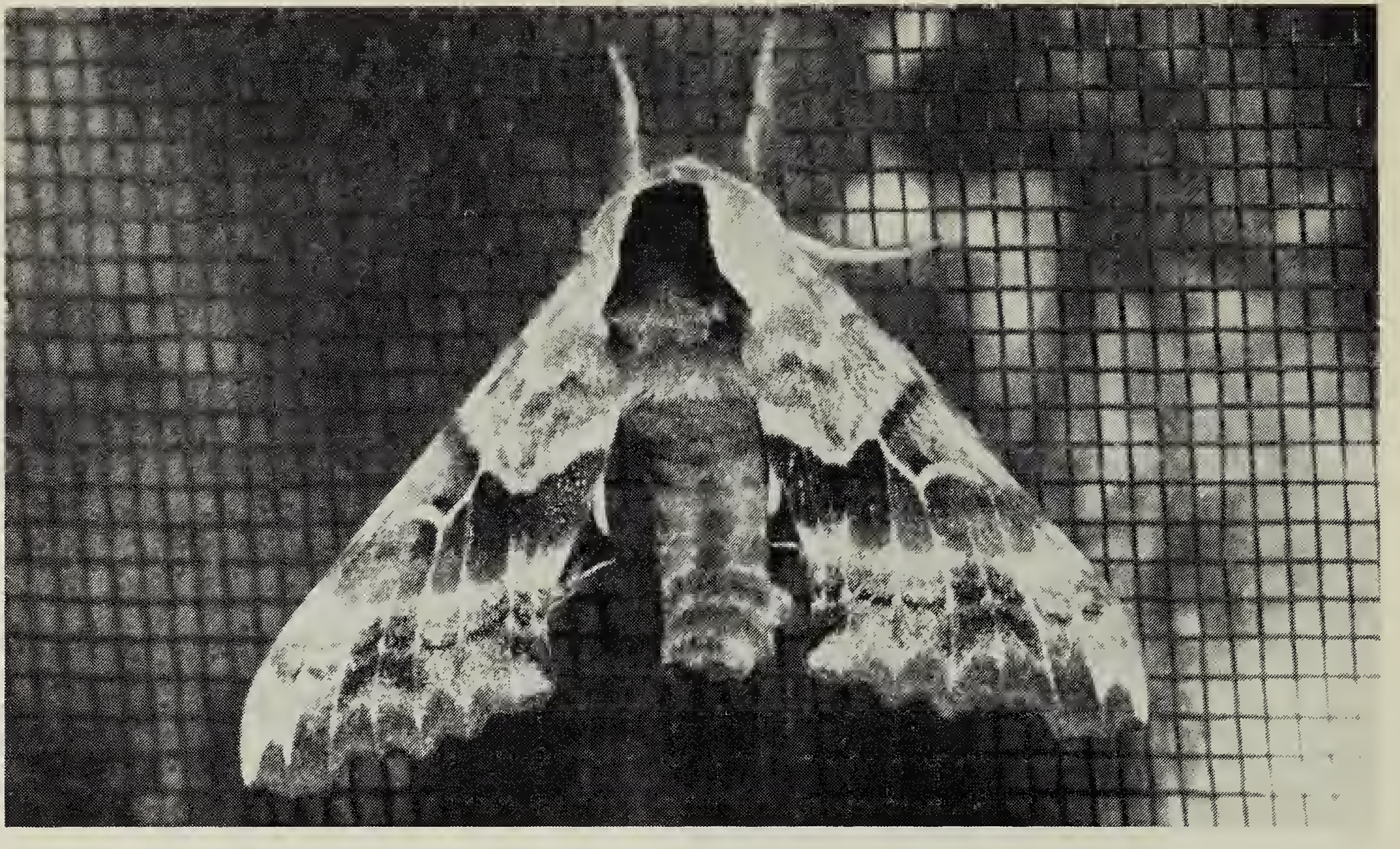
Snowberry Clearwing - *H. diffinis* (Bdv.) — s Sask., n to Sturgeon Landing and Otter Rapids

Gaudy Sphinx - *Eumorpha labruscae* (L.) — Lancer (1 stray)

Strecker's Day Sphinx - *Proserpinus juanita* (Stkr.) — Killdeer Badlands

Yellow-banded Day Sphinx - *P. flavofasciata* (Wlk.) — Bjorkdale, Nipawin Provincial Park and s end of La Ronge Lake

Azalea Sphinx - *Darapsa pholus* (Cram.) — central Sask., n to Pelican



Cirisy's Sphinx Moth *Fred Lahrman*

Narrows and Meadow Lake Park, s to Maryfield

Spurge Hawkmoth - *Hyles euphorbiae* (L.) — Introduced at Jamieson and Weyburn (by Biological Control, Department of Agriculture) to control Leafy Spurge.

Galium Sphinx - *Hyles gallii* (Rott.) — throughout Sask.

Striped Morning Sphinx - *H. lineata* (F.) — s Sask., n to Fort Qu'Appelle and Saskatoon

EXPECTED SPECIES
Nessus Sphinx - *Amphion floridensis* B.P. Clark — found in both southern Manitoba and southern Alberta

[1] COLLINS, M.M. and R.D. WEAST 1961. Wild Silk Moths of the United States. Collins Radio Corp., Cedar Rapids, Iowa.

[2] FERGUSON, D.C. 1972. *IN* R.B. DOMINICK *et al.* Mimallonoidea: Bombycoidea (in part). The Moths of America North of Mexico. fasc. 20.2. E.W. Classey Ltd., London.

[3] FRANCLEMONT, J.G. 1973. *IN* R.B. DOMINICK *et al.* Mimallonoidea: Bombycoidea (in part). The Moths of America North of Mexico. fasc. 20.1. E.W. Classey Ltd., London.

[4] HODGES, R.W. 1971. *IN* R.B. DOMINICK *et al.* Sphingoidea. The Moths of America North of Mexico. fasc. 21. E.W. Classey Ltd., London.

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[7] SELMAN, C.L. 1975. A pictorial key to the Hawkmoths of the Eastern United States (Except Florida). Ohio State University, Columbus, Ohio.

[8] STEHR, F. and E.F. COOK 1968. A revision of the genus *Malacosoma* (Hubner) in North America (Lepidoptera:Lasiocampidae): systematics, biology, immatures and parasites. Smithsonian Institute Press, Washington, D.C.

MATING HABITAT OF A TUNDRA STONEFLY IN NORTHERN SASKATCHEWAN

F.M. ATTON, 412 Leslie Avenue, Saskatoon, Saskatchewan. S7H 2Z1

There are five common tundra stoneflies[5] of which three species have been recorded from Saskatchewan.[2] *Diura bicaudata* adults were collected for the first time in Saskatchewan at Patterson Lake on 27 June 1986. The only previous record was a single nymph from Wollaston Lake, collected in 1956. The males are brachypterous (short winged), and four specimens were average length 12.4 mm (11.7 - 13.3 mm). Five female specimens averaged 18.9 mm (18.4 - 19.3 mm). Measurements are as defined in Dosdall and Lehmkuhl.[2]

Patterson Lake (59° 56′ N 102° 19′ W) is in the northeastern corner of Saskatchewan surrounded by sub-arctic boreal forest; the vegetation was scattered black spruce and very thick sphagnum moss at the collection site. As we approached by air on 23 June 1986, Hasbala Lake (about 16 kilometers to the east) was seen to be two-thirds covered by ice. Patterson Lake was reported to have been free of ice on 18 June 1986. The shore of this precambrian lake was a rampart of medium to large-sized boulders with flooded vegetation that was considerably damaged by the recent spring ice movement. Temperatures were 3 - 10 °C at night and 18 - 20 °C at midday.

Diura bicaudata specimens were collected from a few dead spruce stumps distributed 2 - 10 m from the lakeshore. When the dry and broken bark was pulled off, numbers of mating pairs, all facing upward, and one or two additional males were discovered, from 15 - 30 cm above ground level. In one stump there were at least 8 pairs in copulo. On being exposed to light, the insects seemed stunned for 2 or 3 seconds, then turned and ran or fell downward and went as deep as possible into the nearest crevice. The environment under the bark was moist but not wet. Two females were seen on the underside of alder leaves hanging over the water.

This unique mating habitat of *Diura bicaudata* may help the understanding of some features of the behavior of this species. Brinck reports that emergence takes place among stones on the shore at night or in early morning.[1] In other stoneflies the males are frequently seen running about searching for females at the lakeshore, but Brinck did not see this behavior for *D. bicaudata*.[1] The insects apparently leave the shore quickly to seek suitable cover and males do not display the searching behavior of other species. The mating habitat of *D. bicaudata* in the arctic barren grounds, where there are no tree stumps, will be interesting to explore. An arctic stonefly seeking a cryptic mating site may be an adaptation to an environment where protection from wind is largely lacking. On the breezy shore of a lake at Rankin Inlet, in the low arctic, I was impressed that large numbers of another tundra species, *Arcynopteryx compacta* refused to fly, but crawled among the low vegetation.

The considerable numbers of mating pairs in each stump imply some effective method of communication or attraction to the mating site. Some stonefly males drum, but mostly in the presence of females before or after mating. Drumming has not been observed by *D. bicaudata.*[1] Considering the distance from the shore (10 m) and the cryptic position of the males, as well as ambient forest noise, an auditory signal would seem a poor method of attraction. For some other stoneflies Hynes concludes that "attraction seems to be due to some substance extruded by the female."[3] [4] Perhaps the females, capable of flight, first find the preferred mating habitat, then signal the location to males by a chemical signal. There seems to be no other mention of pheromone production by stoneflies.

The observed nearly equal numbers of males and females suggests that *D. bicaudata* males do not emerge earlier than the females, as in many species of stoneflies. This agrees with the conclusion reached by Brinck.[1] The main emergence of this species in central Sweden is in June, which corresponds with the appearance of the Patterson Lake population in 1986.

Acknowlegements

Thanks are given to Mr. L. Dosdall for confirming the identification of this species and for making available helpful literature.

Special thanks are extended to the Saskatchewan Natural History Museum for providing the opportunity to visit Patterson Lake, and especially to D. Baron and K. Roney for their assistance.

[1] BRINCK, P. 1949. Studies on Swedish stoneflies. Oposcula Entomologica, Supplement II. 250 pp.

[2] DOSDALL, L. and D.M. LEHMKUHL. 1979. Stoneflies (Plecoptera) of Saskatchewan. Quaestiones Entomologicae 15:3-116.

[3] HYNES, H.B.N. 1941. The taxonomy and ecology of the nymphs of British Plecoptera with notes on the adults and eggs. Trans. R. Ent. Soc. London, V. 91 Pt. 10.

4 HYNES, H.B.N. 1970. The ecology of running waters. University of Toronto Press, Toronto.

5 RICKER, W.E. 1964. Distribution of Canadian stoneflies. Gewasser and Abwasser 34/35:50-71.

CHRISTMAS BIRD AND MAMMAL COUNTS

Count period is from **Thursday 17 December 1987** to **Sunday 3 January 1988,** inclusive. Count area should be a circle 24 km (15 mi.) in diameter. Counts must be a minimum of 3 hours in duration. Count forms will be mailed to compilers who submitted counts in 1986. Anyone else wishing to send in a count please write for forms to:

Mary I. Houston
863 University Drive
Saskatoon, Saskatchewan
S7N 0J8

Reports of counts should be sent to Mary Houston as soon as possible after they are taken. To be included in the report in the March 1988 Blue Jay they must reach Mary by **8 January 1988** at the very latest.

NORTHERN FOREST OWL SYMPOSIUM PROCEEDINGS

The proceedings of the Northern Forest Owl Symposium held in Winnipeg 3-7 February 1987 are now available from **Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado, 80526** as **General Technical Report RM-142.** These are free of charge.

ENDANGERED SPECIES IN THE PRAIRIE PROVINCES

The proceedings of the workshop on Endangered Species in the Prairie Provinces held in Edmonton 24-26 January 1986 are now available as **Natural History Occasional Paper No. 9** of the Provincial Museum of Alberta. These are available from **Edmonton Natural History Club, Box 1582, Edmonton, Alberta, T5J 2N9** for $10.00 each.

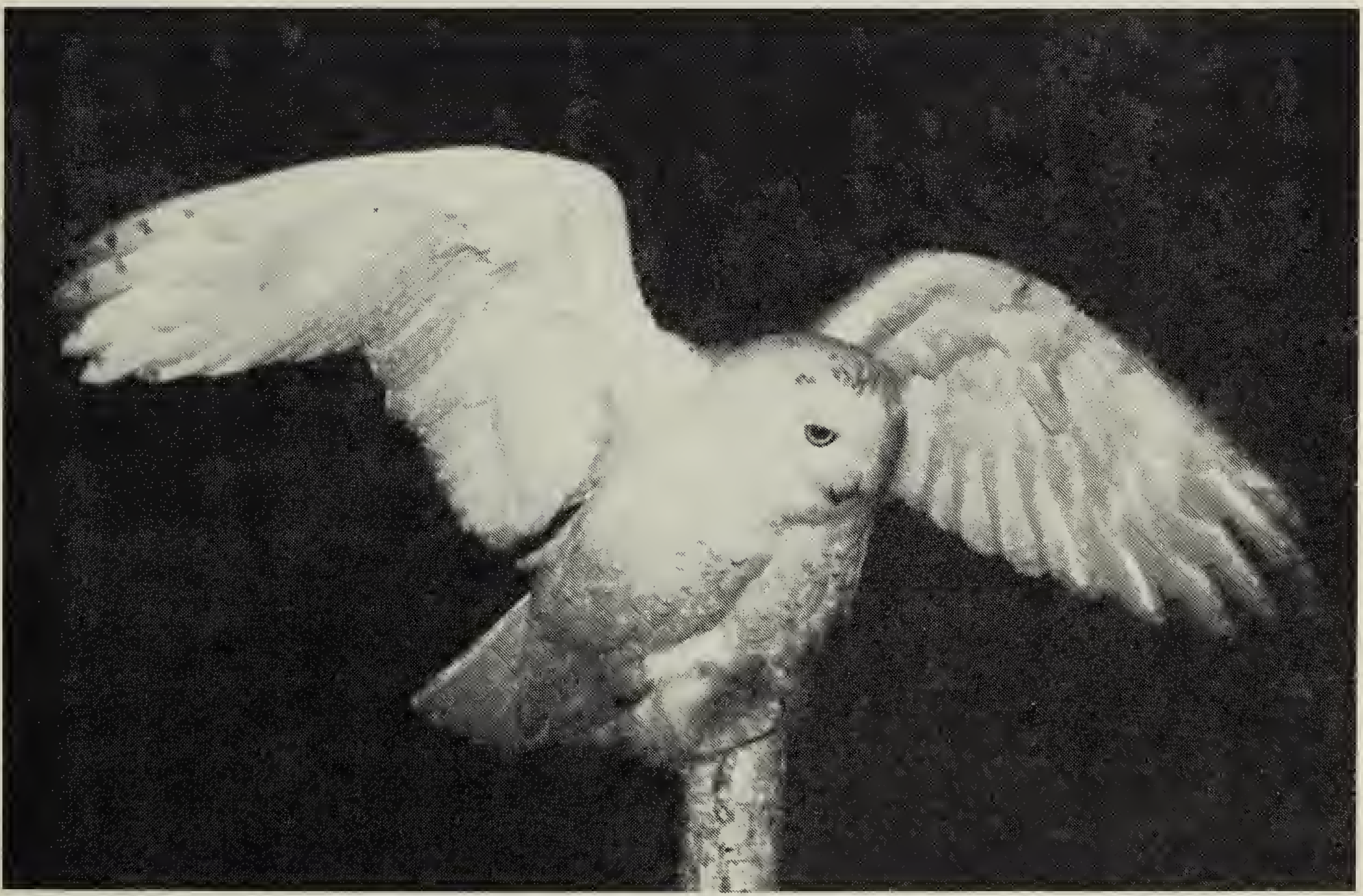
LATER OOLOGISTS IN SOUTHERN MANITOBA: FORGE, NORMAN, LAWRENCE and OTHERS*

C. STUART HOUSTON, 863 University Drive, Saskatoon, Saskatchewan S7N 0J8 and MARC J. BECHARD, Department of Biology, Boise State University, Boise, Idaho, U.S.A. 83725

The first avid oologist in Manitoba after settlement appears to have been Chris P. Forge. Forge arrived from Lincolnshire, England, 15 June 1887, two years before the Canadian Pacific Railway reached Carman. For some years he had a taxidermy shop on the east side of Villiard Avenue in Carman, just south of the bridge. Mary Fisher (nee McQueen), born in Carman in 1892, remembers blond "Ole Chris George", always in need of a haircut and a shave, leaning forward and loping along, as if in a hurry, in a handknit sweater (June M. Watson, pers. comm.).

Forge's first article in *Museum*, told how very abundant Snowy Owls were in 1889, arriving during a cold snap about 5 October and staying until May.[7] Again in 1893 they appeared in large numbers from mid-October to 10 May and in 1897 sixty were shot near Carman. Forge trapped two pairs alive and kept them in a cage, hoping in this way to get a set of eggs of this Arctic species. However, the female died and the remaining three were males.

Forge published a four-part article about



Snowy Owl *R.E. Gehlert*

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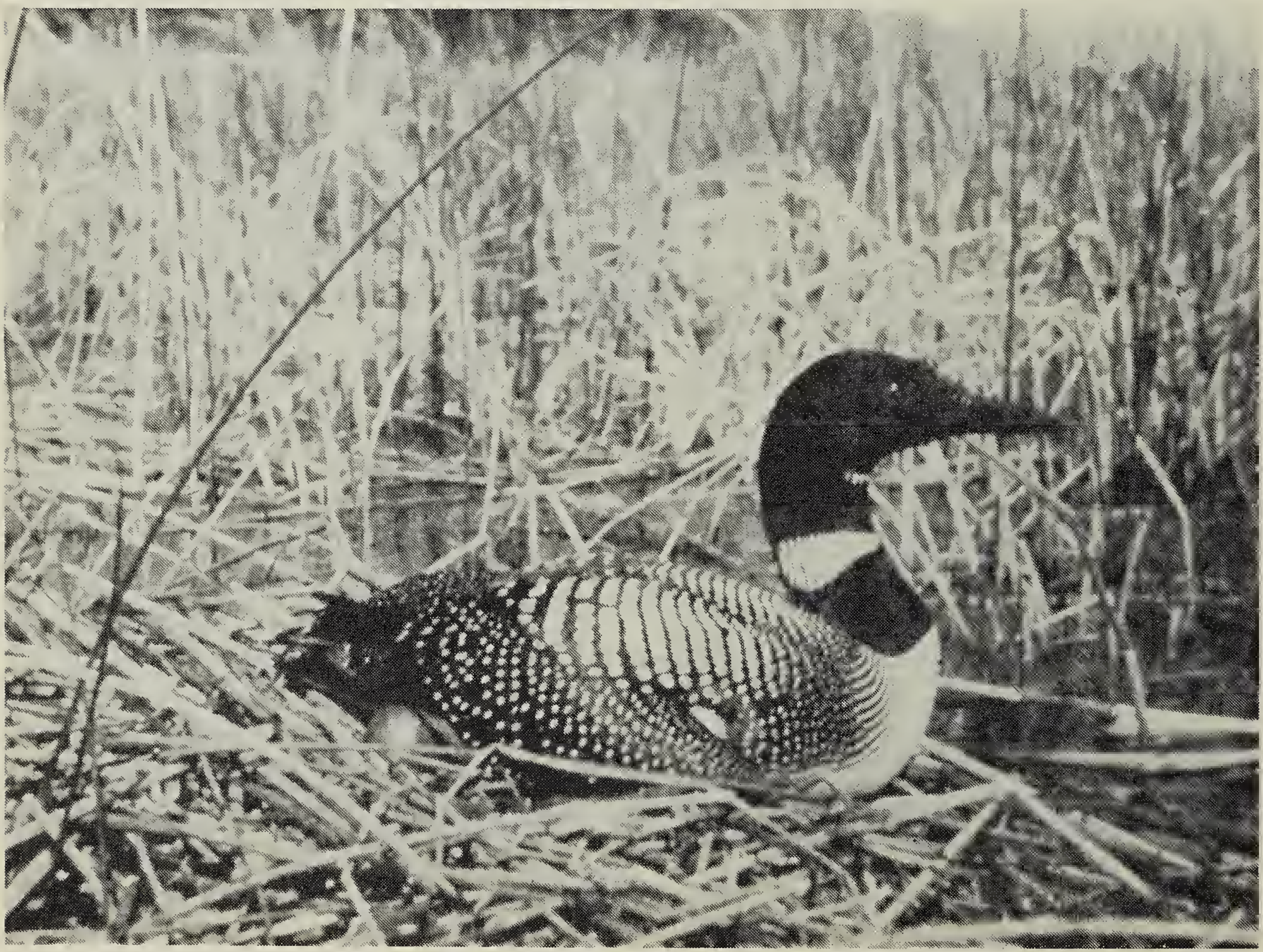
*Seventh in a series on oologists of the Northern Great Plains raptor nests in *The Oologist* in 1901[8] In it, he described his first nest of the Great Horned Owl, with three young, found in 1892. He found another on 15 April 1893 in a former Broad-winged Hawk's nest with two young and two eggs far incubated, which he left to hatch. At a third nest in a giant basswood over the Boyne River in 1894 the female struck him and punctured his vest and two shirts with her talons. In 1895, 1898, 1900, and 1901, he found additional owl nests with 2, 2, 2, 2, and 4 eggs. The adult owls showed quite variable coloration so he considered them to represent three different subspecies.

A good climber, he took substantial risks, as in May 1900 when he climbed to a Red-tailed Hawk nest 30 feet up in a dead poplar that was half burned through at the bottom. That spring he collected 19 sets of Red-tailed Hawk eggs, several sets of which were laid by very pale birds he called Krider's Hawks. In two other instances he flushed a female hawk off her nest before the eggs were laid; in both cases and in four similar instances with Swainson's Hawks, all deserted.

In 1900 and 1901, Forge went 25 miles west to the farm of a "Mr. A." who shared his interest in oology. The two went another five miles to two lakes, "Loon Lake" and "Bosey's Lake," somewhere near Rathwell.[9] Here Forge obtained eggs of the Common Loon and Red-necked Grebe and saw fledged Saw-whet Owls and flightless young Sandhill Cranes.

In 1902, Forge's best find was a nest of the Common Yellowthroat northeast of Carman in a remnant of the Big Boyne Marsh, which had begun to be drained in 1898.[22] On 30 May 1906, with still enough water for cranes, he took two Whooping Crane eggs, the last set to be taken in Manitoba. This set, now in the Western Foundation of Vertebrate



Common Loon *Fred Lahrman*

Zoology (WFVZ), carries a locality label of "Duff Co.," an abbreviation for Dufferin County (now a municipality), a source of confusion to later ornithologists.[1]

Because nest records from early settlement days are scarce, and hence valuable, we offer the following record of Forge sets in four major museums: In the Western Foundation of Vertebrate Zoology, Forge sets are well represented, including two Common Loon eggs from Rathwell on 21 June 1900; single Red-necked Grebe sets taken at Rathwell in 1901 and Belmont in 1903; seven clutches of Northern Harrier between 1901 and 1907; three sets of Sharp-Shinned Hawk, one in 1901 and two in 1907; five of Broad-winged Hawk near Hyde Park and one at Ravenswood between 1903 and 1908; one Swainson's Hawk in 1903 and two in 1905; a Krider's Red-tailed Hawk at Salterville on 3 May 1901; a set of three Ferruginous Hawk eggs collected 25 feet in an elm at Hyde Park on 10 June 1907;[3] one Sharp-tailed Grouse nest at Carman in 1901 and one at Barnsley in 1902; eight Greater Prairie Chicken sets from Salterville, Myrtle, Roland and Elm Point, 1900-1903; three sets of Sandhill Crane, each of two eggs, from the Boyne Marsh 16 miles east of Carman, on 26 May 1905, 25 May 1907 and 30 May 1909. Also in the WFVZ are Forge sets of Marbled Godwit; Common Tern; Sora (2 sets); Black Tern (8 sets, from Boyne Marsh, Grant's Marsh and a lake near St. Claude); three Long-eared Owl nests in 1900 and 1901 from Campbellville and Barnsley; Short-eared Owl (2); and one to three sets each of Eastern Kingbird, Clay-colored Sparrow, Rose-breasted Grosbeak, Warbling Vireo, Yellow-headed Blackbird, Brown-headed Cowbird, Blue Jay, and American Crow. The ten sets attributed to the Rusty Blackbird, seven from Ravenswood, and one each from Barnsley, Carman and Elm Creek, were almost certainly those of the Brewer's Blackbird.

In the Royal Ontario Museum of Zoology (ROMZ) are Forge's sets of the following species: Western Grebe, Lake Rathwell, 1909; Burrowing Owl, Myrtle, 1902; Long-eared Owl, Carman, 1901; Short-eared Owl, Boyne Marsh and Salterville, 1907. There is also a set of 13 Greater Prairie Chicken eggs taken by J.W. Preston at Carman on 30 May 1899. In the National Museum of Canada (NMC) is a set of three Broad-winged Hawk eggs taken by Forge at Hyde Park, Dufferin County, on 30 May 1906.

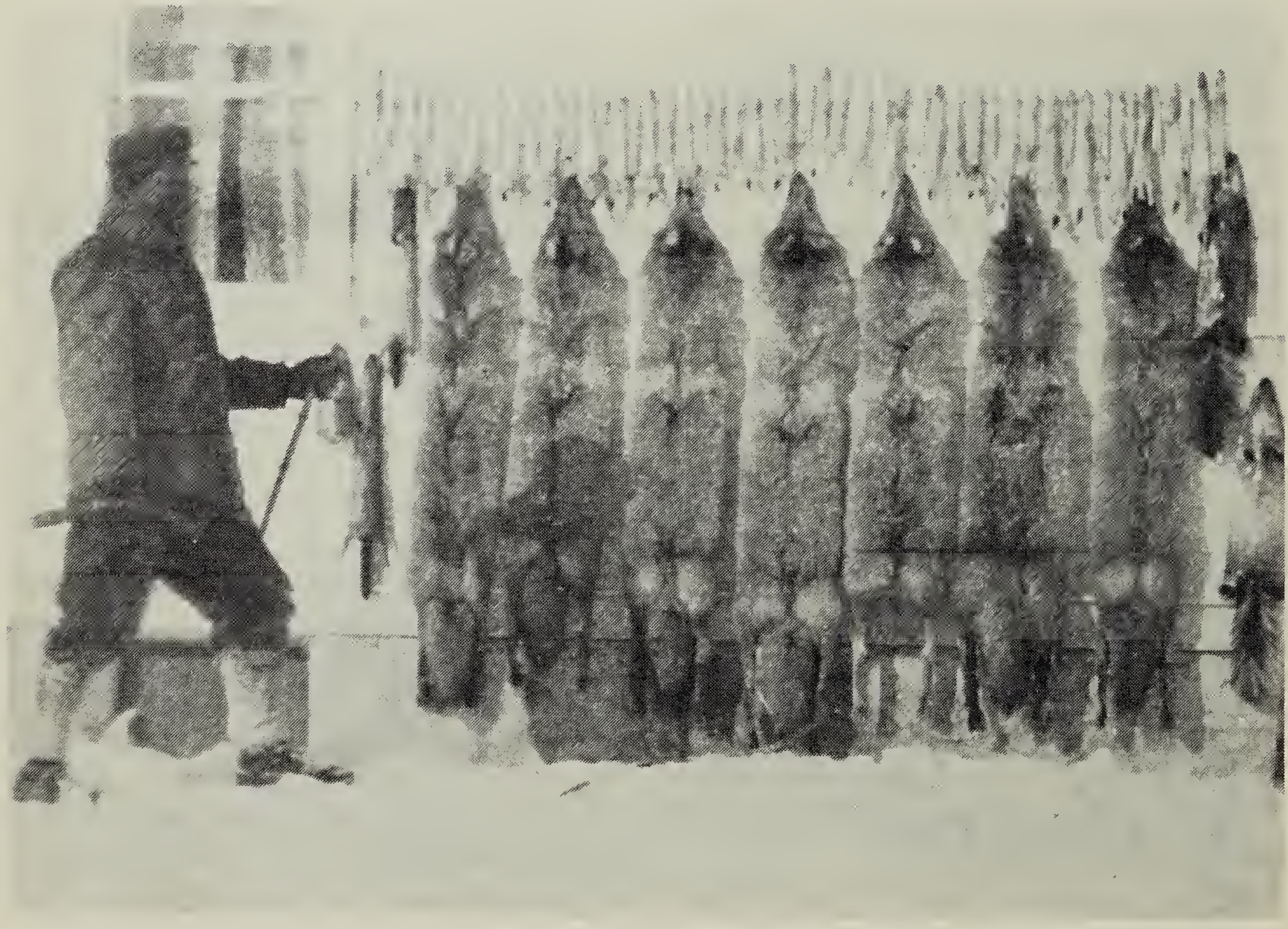
The American Museum of Natural History (AMNH) holds a Forge set of five Northern Hawk-Owl eggs taken on the Assiniboine River on 20 June 1907, plus sets of the Red-tailed Hawk, Greater Prairie Chicken, Sharp-tailed Grouse, Spotted Sandpiper, Black Tern (2 sets), Eastern Kingbird, Tree Swallow, House Wren, Veery, Gray Catbird, Clay-colored Sparrow and Sharp-tailed Sparrow.

Eggs donated to the National Museum of Natural History (NMNH) by discriminating collectors A.C. Bent and T.W. Richards contain some Forge sets of special interest: a Greater Prairie Chicken from Salterville on 24 May 1904; Broad-winged Hawk from Hyde Park on 10 June 1905 and 5 June 1906; Chestnut-collared Longspur from Salterville on 10 June 1903; and five sets of Clay-colored Sparrow in 1900 and one in 1905. Additional Forge sets from near Carman include those of Northern Harrier, Red-tailed Hawk, Sharp-tailed Grouse (2 sets), Black Tern (2 sets), Long-eared Owl, and Short-eared Owl (2 sets).

In 1904 and 1909 Forge made trips to the Pembina Mountains west of Morden, where he collected a Red-tailed Hawk set and a bluebird set, identified as those of the Western Bluebird, but probably of the Mountain Bluebird (NMNH). In 1910 he made a trip to Dog Lake, southwest of Ashern, where he took three sets of the Common Tern (WFVZ). By this time he had moved to the southwest quarter of section 3, township 11, range 7, 5 miles south and 3 miles west of Portage la Prairie (June M. Watson, pers.comm.). Here he took a set of Great Horned Owl eggs in 1911 and a set of Long-eared Owl eggs in 1912 (ROMZ). These are the last of his extant sets, though he was still on the voter's list there in 1923.

The next keen oologist in Manitoba was Ernest S. Norman, who was born in Finland, where he began his egg collection about 1880. We do not know when he came to North America, but after residing for at least six years at Doe Lake, Ontario, he moved in 1914 to a farm on the north shore of Birch Lake, east of Mulvihill in the interlake district.[13] For some years the rural post office of Kalevala, Manitoba, was in Norman's farm home.[2] Between 1914 and 1921, Norman published excellent notes in *The Oologist* concerning the nesting habits of the Common Loon, Great Horned Owl, Northern Hawk-Owl and Greater Yellowlegs at Kalevala as well as a supplement to Taverner's list of birds at Shoal Lake, 25 miles to the southeast, in the *Canadian Field-Naturalist*.[13] [14] [15] [17] [16] [21] Thomas Randall has credited Norman's 1915 nest of Greater Yellowlegs at Kalevala as the second ever found.[19] In 1926, owing to illness, Norman was forced to advertise his valuable raptor egg collection for sale. Through trades, it had grown to include eggs of almost every species and subspecies of North American raptors, including all five species of kites. (He did not acquire sets of the Condor, Snowy Owl or Northern Saw-whet Owl.) He considered his five sets of Golden Eagle eggs particularly valuable, asking $15, $12 and $10 per egg, depending on the markings; he asked $7.50 each per egg of the Boreal Owl and Richardson's Merlin and $3 each for Sharp-shinned Hawk eggs.[18]

Norman's egg sets, well represented in WFVZ (31 species), NMC (6 species), AMNH (5 species), and ROMZ (4 species), include the following: Common Loon, Horned, Red-necked and Eared grebes,



Ernest S. Norman, Kalevala, Manitoba about 1920 *Photo courtesy Ray Quigley*

Canada Goose, Green-winged and Blue-winged teal, Mallard, American Wigeon, Canvasback, Ring-necked Duck, Lesser Scaup, Common Goldeneye, Red-breasted Merganser, Northern Harrier, Sharp-shinned Hawk, Red-tailed Hawk, American Kestrel, Ruffed Grouse, Sharp-tailed Grouse, Virginia Rail, Sora, American Coot, Upland Sandpiper, Lesser Yellowlegs, Spotted Sandpiper, Common Snipe, Wilson's Phalarope, Black Tern, Great Horned Owl, Northern Hawk-Owl, Common Nighthawk, Yellow-shafted Flicker, Great Crested Flycatcher, Cedar Waxwing, House Wren, and Savannah Sparrow. Also in the ROMZ are a set of 13 eggs of the Common Goldeneye taken by Norman's neighbor, G. Mattson, on 1 June 1930.

Sets in the Provincial Museum of Alberta (PMA) show that Norman's Manitoba collecting continued at least through 1935, including sets of Common Loon (3), Red-necked Grebe, Mallard (2), Broad-winged Hawk (2), Red-tailed Hawk (2), Sharp-tailed Grouse, American Coot, Killdeer (6), Upland Sandpiper (2), Lesser Yellowlegs (3), Common Snipe (3), Wilson's Phalarope, Black Tern, Common Nighthawk, Whip-poor-will (3), Great Crested Flycatcher, Eastern Kingbird, Blue Jay and American Robin.

Meanwhile, a few nonresident oologists visited southern Manitoba after the turn of the century. In 1901, Frank M. Chapman, editor of *Bird-Lore* and newly-appointed as Associate Curator of Birds and Mammals at the American Museum of Natural History in New York, came with his wife to Shoal Lake north of Marquette.[6] While collecting specimens for habitat groups in June and early July, he was joined for at least three days by Ernest Thompson Seton, who helped collect sets of the Common Tern and Yellow-headed Blackbird.

In 1905, Ray Densmore came from Painesville, Ohio, to Westbourne, Manitoba, where he collected sets of Northern Shoveler, Virginia Rail, American Coot, Cliff Swallow, Clay-colored Sparrow, Yellow Warbler and Yellow-headed Blackbird (WFVZ). In the 1920s, oologists George Davy and David Ogg from nearby Antler, North Dakota, and J.D. Currie from South Dakota, occasionally crossed the 49th parallel to take one set of Loggerhead Shrike and sets of Swainson's and Ferruginous hawks.[3] [4] George Davy took a set of four Screech Owl eggs inside the Manitoba boundary, 3.5 miles northeast of Antler on 8 April 1928 (WFVZ).

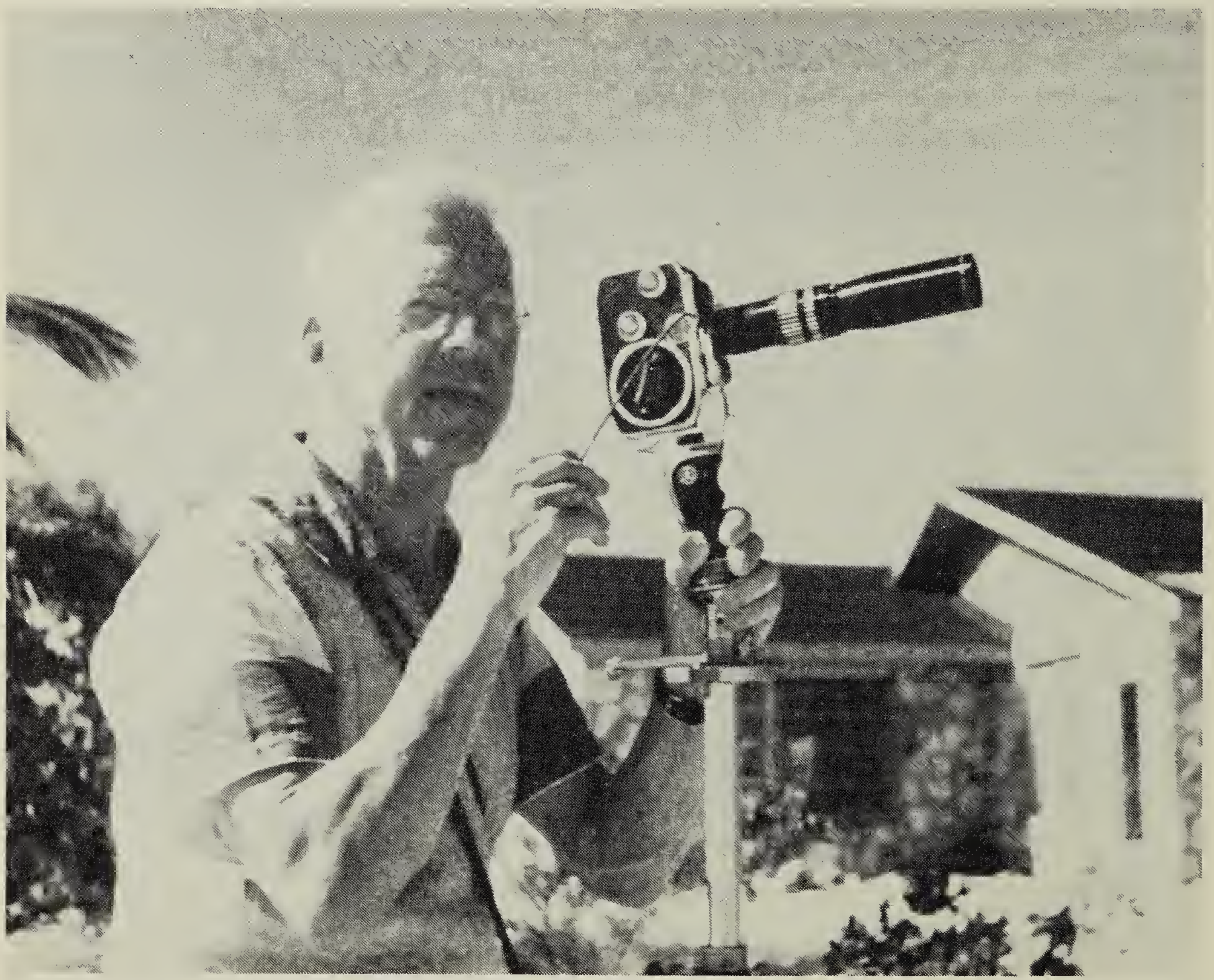
A.C. Bent not only wrote 20 volumes of his famous Life Histories, but was an enthusiastic oologist with an unusually large egg collection. Bent made one collecting trip to Manitoba, accompanied by F. Seymour Hersey, in 1913. At Meadow Portage, apparently their main base, Hersey collected five eggs of a new immigrant to the area, the House Sparrow. They visited Waterhen Lake north of Skowman and travelled north the length of giant Lake Winnipegosis to Birch Island and Whiskey Jack Island, and west to Salt Point in Dawson Bay. They took egg sets, now in NMNH, of the Common Loon, Red-necked Grebe (3), American White Pelican (6), Double-crested Cormorant (3), Common Merganser (2), American Coot, Killdeer (2), Common Tern (11), Black Tern (2), Yellow-bellied Sapsucker, Sedge Wren, Savannah Sparrow, Le Conte's Sparrow, Song Sparrow (3), White-throated Sparrow, and Common Grackle.

Egg collections were a relatively minor by-product of National Museum of Canada collecting trips to Manitoba made by P.A. Taverner, C.H. Young and W. Ward. During a brief visit to Douglas in 1916, single sets of Wilson's Phalarope and Loggerhead Shrike were taken, 26 May and 1 June. Longer visits to West Shoal Lake between 28 May and 11 June 1917 and 7-18 June 1918, resulted in sets of Red-tailed Hawk, Upland Sandpiper, Wilson's Phalarope, Black Tern, Common

Nighthawk, and Western Meadowlark.[21]

A.G. Lawrence, editor of the weekly column, "Chickadee Notes" in the Winnipeg Free Press from 1921-1955, was also a keen oologist.[10] [11] His extensive collection, donated to NMC, usually contains only one set for each species, but he made an exception for species he considered "harmful," such as six sets of the American Crow and Cooper's Hawk sets of 4, 5, 5 and 5 eggs from three different trees on the University campus at Fort Garry in 1927, 1928, 1929 and 1931. Lawrence had a further set of five Cooper's Hawk eggs from Hillside Beach in 1929. He also took three sets of Broad-winged Hawk eggs in 1927, 1931 and 1932. In 1931 he took one Osprey egg from a nest 40 feet above ground in a poplar at Hillside Beach and 14 days later climbed it again to obtain another four eggs.

Lawrence's most exciting experience, both as an ornithologist and oologist, was his involvement with what he believed to be North America's first fully documented Evening Grosbeak nests with eggs. On 17 June 1930 L.E. McCall showed Lawrence two nests in the residential area of Selkirk. The first with five eggs was in the crotch of a Manitoba maple, 28 feet above the ground. The second with four eggs was 19 feet above ground on an overhanging branch of an elm. Lawrence submitted quality photographs to A.C. Bent, who enthusiastically promised to use them in his Life Histories — but neither Bent nor Lawrence lived to see publication of the volumes dealing with the Fringillidae in 1968 — and by then, Oliver L. Austin, Jr., Bent's successor, had even better photographs of grosbeak nests to use. The photo was, however, used in the Manitoba Natural History Society's 21-year anniversary bulletin.[12]



A.G. Lawrence

Ruby-throated Hummingbird nest *A.G. Lawrence*
[This photo was made into a very attractive greeting card sent Xmas 1947.]

Lawrence sets from Manitoba in NMC include Pied-billed Grebe, American Bittern, Mallard, Northern Pintail, Lesser Scaup, Common Goldeneye, Ruddy Duck, Osprey, Northern Harrier, Cooper's Hawk, Broad-winged Hawk, Red-tailed Hawk, Greater Prairie Chicken, Virginia Rail, Sora, Piping Plover (single sets from Hillside Beach in 1932, 1933 and 1934), Spotted Sandpiper, Franklin's Gull, Ring-billed Gull, Common Tern, Black Tern, Mourning Dove, Burrowing Owl (St. Charles 18 May 1919), Boreal Owl (near Whitemouth on 15 May 1932), Whip-poor-will (taken by J. Smith at Teulon on 28 May 1928), Ruby-throated Hummingbird, Northern Flicker, Olive-sided Flycatcher (taken by Rogers at Hillside Beach, 20 June 1934), Yellow-bellied Flycatcher (at Vivian, 15 July 1928), Alder Flycatcher, Least Flycatcher, Eastern Phoebe, Great Crested Flycatcher, Eastern Kingbird, Horned Lark, Tree Swallow, Rough-winged Swallow, Cliff Swallow, Barn Swallow, House Wren, Sedge Wren (at Hillside Beach 12 July 1930), Marsh Wren, Veery, Swainson's Thrush, American Robin, Brown Thrasher, Cedar Waxwing, Loggerhead Shrike, European Starling, Yellow-headed Vireo, Warbling Vireo, Red-eyed Vireo, Nashville Warbler, Yellow Warbler, Chestnut-sided Warbler, Magnolia Warbler, Yellow-rumped Warbler, Blackburnian Warbler, Black-

and-white Warbler, American Redstart, Ovenbird, Common Yellowthroat, Rose-breasted Grosbeak, Indigo Bunting (at Hillside Beach 2 July 1927), Rufous-sided Towhee, Vesper Sparrow, Savannah Sparrow, Sharp-tailed Sparrow (near Whitemouth, 5 June 1932), Song Sparrow, White-throated Sparrow, Dark-eyed Junco, Chestnut-collared Longspur, Red-winged Blackbird, Western Meadowlark, Yellow-headed Blackbird, Brewer's Blackbird, Common Grackle, Northern Oriole, and American Goldfinch.

Lawrence's friend and correspondent, Victor B. Latta, provided him with the following sets from the immediate area around Whitemouth: Common Loon, Sharp-shinned Hawk, American Kestrel, Wilson's Phalarope, Great Horned Owl, Yellow-bellied Sapsucker, Downy Woodpecker, Hairy Woodpecker, Three-toed Woodpecker (taken on 4 June 1934), Pileated Woodpecker, Gray Jay (6 March 1934), Ruby-crowned Kinglet, Hermit Thrush, Philadelphia Vireo (10 July 1932), Connecticut Warbler (14 June 1933), Swamp Sparrow, and Bobolink. The only Latta sets that duplicated Lawrence's were Broad-winged Hawk, Yellow-bellied Flycatcher (25 July 1932), Common Yellowthroat and Sharp-tailed Sparrow (9 June 1934). Latta's claim to have taken a Baird's Sparrow set in the parkland-mixed forest habitat near Whitemouth is questionable. Latta's sets of Northern Flicker, Downy Woodpecker and Black-backed Woodpecker are in the Provincial Museum of Alberta.

Bertram W. Cartwright provided Lawrence with sets of Double-crested Cormorant, Herring Gull, and Yellow-throated Vireo (the latter taken at St. James, 9 June 1929). Much of the remainder of Cartwright's collection is now in the PMA, including sets of Double-crested Cormorant, American Bittern, Mallard, Northern Harrier, Cooper's Hawk, Ruffed Grouse, Sora (2), Killdeer, Spotted and Upland Sandpipers, Franklin's and Herring Gulls, Common and Black Terns, Mourning Dove, Burrowing Owl, Northern Flicker, Least Flycatcher, Eastern Kingbird, Horned Lark, Northern Rough-winged Swallow, Bank Swallow, Blue Jay, Veery, Gray Catbird, Chestnut-sided and Blackburnian warblers, Scarlet Tanager (taken near Winnipeg,1933), Song, Savannah, Baird's, Chipping, Clay-colored and Vesper sparrows, Chestnut-collared Longspur, Brown-headed Cowbird (2 sets),and House Sparrow (2 sets). Additional sets, including those of Blue-winged Teal, Northern Shoveler, Gadwall, Ruddy Duck, Forster's Tern, and Great Crested Flycatcher were provided to Lawrence by Charles L. Broley, who also provided the PMA with sets of Eared Grebe and Black-crowned Night Heron. Burton Gresham donated a Bank Swallow set to Lawrence and A.M. Mackie gave him a Dickcissel set obtained at Charleswood on 25 June 1933. More distant from Winnipeg, the Criddle brothers, Norman and Stuart, from near Treesbank, contributed sets of Cooper's Hawk, Orange-crowned Warbler and Sprague's Pipit. At East Bay near Dauphin, Ed Robinson collected three Northern Goshawk eggs on the early date of 12 April 1942, and these, too, were transmitted to NMC with the Lawrence collection. Dr. H.M. Speechly, a good friend of Lawrence's, seems to have forwarded two Ruby-throated Hummingbird eggs from Pilot Mound directly to the NMC in 1910.

Also in the PMA are single sets of Pied-billed Grebe and Red-tailed Hawk taken at Franklin and Slate-colored Junco at Wasagaming by Eric Kiteley in 1921, and a set of Brown Thrasher taken by B. Lamb at Winnipeg in 1927. In 1929, Terence M. Shortt collected sets of the Broad-winged Hawk, Tree Swallow and Cedar Waxwing near Winnipeg, and in 1930, sets of the White-throated Sparrow and Red-winged Blackbird at Belair. Shortt and Charles L. Broley each collected two sets of Franklin's Gull eggs at Grant's Lake, near Rosser in 1934. Four Baird's Sparrow sets

Bertram W. Cartwright *Photo courtesy Ducks Unlimited* were collected by Shortt at Deer Lodge on the western outskirts of Winnipeg in 1931 through 1934 as part of a detailed study of this species, together with a set of the Chestnut-collared Longspur.[5] In 1937, R. Fryer took a Western Grebe set at Gimli and T.E. Howard took a Bank Swallow set at Argyle.

The last major collector in southern Manitoba was Sam Waller. Although an amateur, Sam had been collecting for the ROMZ while working for Indian Affairs at Moose Factory in Ontario. When he was transferred to the Lake St. Martin Indian Reserve in 1930, he continued collecting specimens for them. The museum decided in 1934 to augment the collection from this interesting area by sending T.M.Shortt and his brother Angus for two weeks in June 1934 to help Waller collect further specimens, including some nests and eggs.[20] Sets collected through 1936 were listed in their 1937 publication.[20] Waller continued collecting for the museum, especially at Jackhead Island on Lake Winnipeg in 1938, and later at The Pas for his own Little Northern Museum.

Until about 1930, egg-collecting had been one of the commonest beginning activities for those who were to become serious birdwatchers. As evident in the above account, most Manitoba ornithologists had private egg collections. As better bird books and binoculars became available in the late 1930s, collecting of bird specimens and eggs rapidly diminished, and soon became a thing of the past.

Acknowledgements

We wish to thank Lloyd Kiff of the Western Foundation of Vertebrate Zoology, Henri Ouellet of the National Museum of Canada, Alison Victor Andors of the American Museum of Natural History, Ross James of the Royal Ontario Museum of Zoology, Philip H.R. Stepney of the Provincial Museum of Alberta and James Dean of the National Museum of Natural History for assistance concerning their egg collections. June M. Watson offered details concerning Chris Forge. Mary Houston helped transcribe egg data at WFVZ and indexed the egg data by collector and by species. Bernard Gollop and Margaret Belcher provided constructive criticism.

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Bird watching *Fred Lahrman*

SCOTER MIGRATION IN SOUTHEASTERN MANITOBA, 1975-1986

PETER TAYLOR, P.O. Box 597, Pinawa, Manitoba R0E 1L0 and RUDOLF F. KOES,
135 Rossmere Crescent, Winnipeg, Manitoba. R2K 0G1

The status of scoters in Manitoba is poorly understood, because these ducks occur mainly in thinly populated parts of the province. Substantial numbers of all three species occur in the Churchill region, but they do not appear to be common anywhere inland.[11]

The published breeding range of the White-winged Scoter includes nearly all of the province, but this species has declined drastically in southern Manitoba and neighboring North Dakota.[1 5 6 17] As recently as 1974, David Hatch found seven nests at Oak Lake, in southwestern Manitoba, but it is doubtful whether any now nest south of the forested regions of the province.[6] Bellrose cites an estimated Manitoba population of 27,000 scoters, nearly all White-winged, of which almost 90% occur on lakes in the boreal forest region, and 7% in the Saskatchewan River delta.

The other two scoters have probably not bred in southern Manitoba in historic times. The Surf Scoter's nesting range is believed to include much of the open boreal forest region of northern Manitoba.[1 5] Faanes recently reported a brood near Churchill.[3] The Black Scoter's nesting range is disjunct and poorly known, but is thought to include northeastern Manitoba and adjacent Ontario.[1 16] Many thousands moult along the coast of James and Hudson Bays.[1 16]

Since most scoters migrate directly from their breeding range or moulting areas to either the Atlantic or Pacific coast, they are scarce migrants in the southern Prairie Provinces.[5] Banding returns for White-winged Scoters, reported by Houston and Brown, indicate that central Saskatchewan lies on the "migration divide" between populations wintering on the two coasts.[10]

As recently as 1978, both Surf and Black scoters were classed as occasional ("From 6 to 12 confirmed observations since 1945") in southeastern Manitoba.[2] Most of these records occurred between 1975 and 1977, causing speculation that these two species may be regular fall migrants in southern Manitoba.[12] Thompson's accounts of their status in Manitoba in the 19th century are, unfortunately, ambiguous.[19]

Scope of this report

This analysis includes 150 scoter records from southeastern Manitoba (as defined in the map in fig. 1) from 1975 to 1986. These sightings are by both Taylor and Koes as well as others which were reported to Koes. Sightings for which observers are not given are referable to one or both of the authors, often in company with other observers. Records prior to 1975 are included only when they occurred outside the extreme migration dates of the period being analysed.

The records total 575 birds, of which about 30% are believed to be repeat sightings of the same individuals on different days. The overall breakdown by species is 9% Black (51), 25% Surf (141) and 66% White-winged (383). Dates are summarized for each species in Table 1. Sixty-six percent of these sightings occurred at Natalie Lake, which is the forebay of Seven Sisters dam on the Winnipeg River. Most of the remainder were at the southern ends of Lakes Manitoba and Winnipeg (9% each) and at Oak Hammock Marsh (8%; fig. 1). The preponderance of records at Natalie Lake arises partly from intensive coverage by Taylor (two or three visits per week in May and October since 1978), but this location does seem to be specially favoured by scoters, as well as other migrating water birds.[18]

Nearly all groups of scoters consisted of only one species, except for a few single male Surfs associating with flocks of White-winged in spring. On the few occasions when flocks of both species were seen in the same general area, they remained as distinct groups, while mingling with large aggregations of scaup and other waterfowl. Information on the size of scoter groups is also summarized (Table 2).

Black Scoter

This is the least common scoter in southeastern Manitoba. There is only one spring record: George Holland saw two males at Oak Hammock Marsh, 23 April

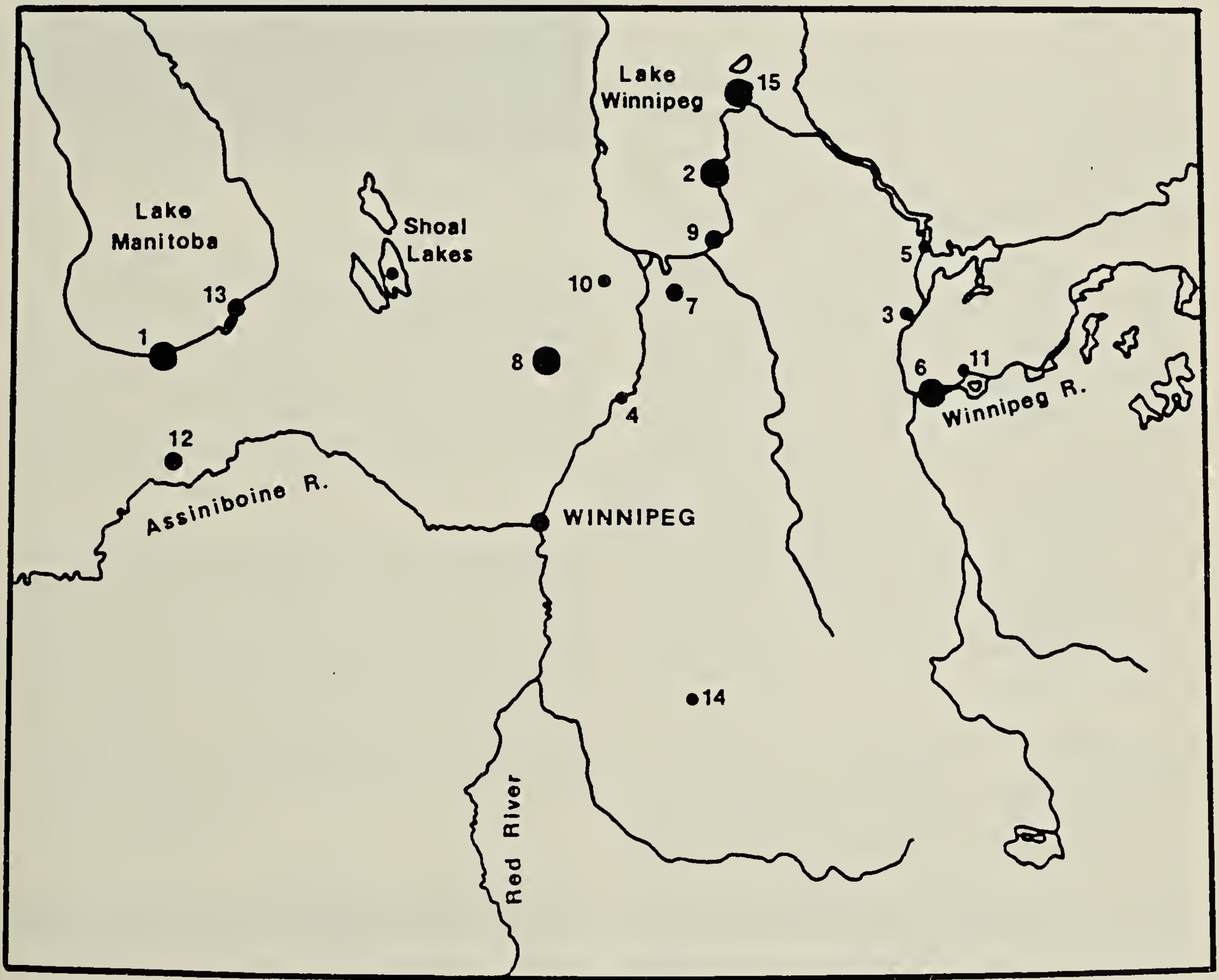

Figure 1. *Distribution of scoter sightings in southeastern Manitoba, 1975-1986. Numbered locations (species initials in parentheses): 1 Delta (B,S,W); 2 Grand Beach and Grand Marais (B,S,W); 3 Lac du Bonnet (S,W); 4 Lockport (S); 5 McArthur Falls (W); 6 Natalie Lake (B,S,W); 7 Netley-Libau Marshes (B,S,W); 8 Oak Hammock Marsh (B,S,W); 9 Patricia Beach (W); 10 Petersfield (W); 11 Pinawa (B,S); 12 Portage la Prairie (S,W); 13 St. Ambroise (B,S,W); 14 Steinbach (S); 15 Victoria Beach (B,S). Small circles 1 or 2 records (includes East Shoal Lake - W). Medium circles 3-5 records (includes Winnipeg - S, W.) Large circles 6+ records.*

1975[4] In contrast, there are 23 fall records (49 birds), from every year of the study except 1983 and 1985. Most were seen in October; extreme dates are 25 September 1979 and 19 November 1977. The highest counts were five at Libau 17 October 1981 (John Christie and L. Simmons), a group of four at Victoria Beach 12-19 November 1977, and four scattered birds at Natalie Lake 21 October 1984. All individuals that could be determined were females or immature males.

Table 1. NUMBERS OF SCOTERS SEEN BY SPECIES AND DATE (Scoter-days, including repeat sightings)

Time Period	*Black Scoter*	*Surf Scoter*	*White-winged Scoter*
21-30 April	2	1*	5
1-10 May	0	2	38
11-20 May	0	3	121
21-31 May	0	8	20
1-10 June	0	2	9
11-20 June	0	0	2
TOTAL SPRING	2	16	195
21-31 August	0	0	1
1-10 September	0	1	0
11-20 September	0	0	0
21-30 September	1	2	0
1-10 October	6	81	0
11-20 October	13	33	80
21-31 October	15	4	86
1-10 November	1	2	19
11-20 November	13	2	1
21-30 November	0	0	1
TOTAL FALL	49	125	188

* Reported only as April.

Table 2. NUMBERS OF SIGHTINGS OF SCOTERS, BY SPECIES AND GROUP SIZE

Group Size		*1-2*	*3-5*	*6-10*	*11-20*
Black Scoter	Spring	1	0	0	0
	Fall	15	8	0	0
Surf Scoter	Spring	9	1	0	0
	Fall	20	7	4	2
White-winged Scoter	Spring	19	7	8	5
	Fall	17	17	6	3

Black Scoter *Fred Lahrman*

Surf Scoter

This species is more common than the Black Scoter, but it also is seen much less frequently in spring (16 birds) than fall (125). It was recorded in six of the 12 springs and each fall except 1976, 1981 and 1986.

Except for a male seen in Winnipeg by John L. Wylie in April 1980, all spring birds were on the Winnipeg River. Two males were near Lac du Bonnet 4 June 1983 and a flock of five, including one adult male, was at Natalie Lake on 26 May 1985. The remainder were all single males at Natalie Lake.

Extreme fall migration dates are 4 September 1977 and 19 November 1977, with a well-defined peak in the first half of October (Table 1). The majority (88%) were seen between 1982 and 1985. A concentration at Natalie Lake 1-17 October 1985 accounted for over half the observations (67 birds). The maximum count was 17, including four adult males, on 3 October. Excluding these four, and a few other 1985 sightings, all fall Surf Scoters were females or immature males.

White-winged Scoter

This species accounts for over 90% of spring scoter records, but it is by no means common. Over 80% of these spring sightings were at Natalie Lake, where White-wingeds were seen each spring from 1978 to 1986 except 1981. There are several records of 10 or more birds, with a maximum of 20 on 13 May 1978 (Gordon Grieef). Spring records elsewhere include 15 at Oak Hammock Marsh 16 May 1976 (Ken Gardner) and 8 at Delta 15 May 1982 (Calvin Cuthbert, Ian Ward). Adult males predominate (about 80%) in these spring flocks; some birds appear to be paired.

Extreme migration dates are 24 April 1986 (two at Natalie Lake, Wayne Neily, Robert Parsons) and 19 June 1982 (one at Oak Hammock Marsh, David Hatch). There is a well-defined peak in mid-May (Table 1). These observations are consistent with Hochbaum's summary of arrival dates at Delta between 1939 and 1954: once between 21 and 28 April, four times between 29 April and 6 May, and 10 times between 7 and 14 May, making it the latest duck to arrive on average.[8] The White-winged Scoter bred regularly at Delta until the late 1950s.[9] A very early arrival 14 April 1926 was reported by H. Battersby at Oak Lake in southwestern Manitoba.[14]

Unlike the other two species, spring and fall sightings of White-winged Scoters are almost equal (Table 1). Fall records are rather more scattered however, and observations at Natalie Lake are less predominant than in spring. The distribution of flock sizes is similar to spring (Table 2). The highest count was 18 at Natalie Lake 21 October 1984.

White-winged Scoters tend to migrate in fall a little later than Surf Scoters, peaking in the second half of October (Table 1). They are not normally seen before mid-October. A single male at McArthur Falls 27 August 1983 was, therefore, unusual.

It may have summered there, for a late spring male was also seen 4 June 1983; these are the only two records of scoters at McArthur Falls.

The latest recent fall record was a lone male at Natalie Lake just before freeze-up 25 November 1984. There is one old winter record; a bird was rescued from the ice on the Assiniboine River in Winnipeg by Kenneth Lang 9 January 1925. It was forwarded to H.M. Speechly and later released.[13]

Full information is not available on the plumages of fall White-winged Scoters because distinction in the field at long range is often difficult, but adult males sometimes predominate, e.g. 14 of 16 birds at Natalie Lake 24 October 1982.

Miscellaneous Observations

Nearly all of these scoters were seen resting and feeding on large lakes. Although some pause for less than a day, others appear to remain for a week or more before continuing their migration. Some authorities assert that migrating scoters do not feed on inland stopovers.[15] On the contrary we have observed all three species actively feeding at Natalie Lake and elsewhere. The exact attraction of Natalie Lake is not clear. Its maximum depth is 30 m, little more than several other stretches of the Winnipeg River that do not attract large numbers of diving birds.

There are three records of White-winged Scoters apparently migrating along the Winnipeg River. At about 8 p.m. 5 May 1977 all but one of a flock of 13 left the lake and flew northward (downstream); only one was seen the following day. At about 8 a.m. 20 May 1984 groups of two and seven birds flew downstream past Seven Sisters dam. At 11 a.m. 14 October 1985 five left Natalie Lake, steadily gained altitude and disappeared to the east (upstream).

Although scoters usually occur on large bodies of water, all three species have been seen at sewage lagoons. A Black Scoter was at the Pinawa lagoons 5 November 1977. Two Surfs were at Pinawa lagoons 2-5 October 1983 and two more at the Steinbach lagoons 29 September 1984 (Dennis Fast). One White-winged Scoter was at the Lac du Bonnet lagoons 5 November 1980 and there are three records at the Charleswood sewage lagoons in Winnipeg: four birds 19 and 26 October 1980 and three 4 November 1979 (Holland).

Discussion

Based on these records, the Black Scoter is an accidental spring migrant, but rare and probably regular in fall in southeastern Manitoba. The Surf Scoter is rare and irregular in spring and rare to locally uncommon, albeit erratic, in fall. The White-winged Scoter is rare to locally uncommon and regular in both seasons. This probably represents the southern fringe of a broad movement of scoters across the boreal forest, between the Atlantic Coast and points northwest of the study area.

There are no clear-cut differences in the distribution of records of the three species (Fig. 1). All three have been seen at six locations and two have been seen at another five, out of a total of 17.

The higher frequency of Surf and Black Scoters in fall than spring suggests that some move south on Lakes Manitoba and Winnipeg, and funnel southeastward along the Winnipeg River. The scarcity of records on the Red River which flows north into Lake Winnipeg is noteworthy. Larger numbers might occur far offshore on the large lakes, then leave the province at high altitude. The best time to search for such concentrations is probably the first half of October, although moulting flocks of White-winged Scoters formerly occurred far out on Lake Manitoba in late July.[1] [7]

The increased frequency of Surf and Black Scoter records since 1975 is certainly due in part to increased observer interest and effort, but it may also reflect an absolute increase. The large number of Surf Scoters seen since 1982 seems to be part of a wider phenomenon, judging from records in many parts of North America as reported in *American Birds* (see in particular vol. 39, no. 1, 1985).

Acknowledgements

We are grateful to the many observers cited above and to Reto Zach and Howard Ross for helpful comments on the manuscript.

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OBSERVATIONS OF WHITE-BREASTED NUTHATCH

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Throughout the year in Winnipeg, as well as in various other areas in southern Manitoba, the quaint loud "yank yank" calls of the White-breasted Nuthatch can be heard. This bird's name is thought to be a corruption of "nuthack."[3] It habitually wedges seeds or nuts into crannies of tree bark. It then proceeds "to hack the exposed surface until it cracks the shell and then picks out the contents." It frequents feeding stations where it obtains sunflower seeds, and can be seen storing the food in the bark of a tree for a "rainy day." As it goes up and down a tree headfirst its long, sharp claws give it sure footing on vertical bark surfaces from which it digs out many kinds of insects, insect eggs and pupae. In early spring it has also been seen imbibing at sapsucker sap-wells.[4]

The White-breasted Nuthatch is a cavity nesting bird. According to Stokes, "throughout the year each bird spends the night in a separate roost hole. Sometimes a female takes over a male roost hole in late winter and early spring, and that particular hole may become the nest hole for the breeding season."[7]

On 10 May 1986 I noticed a pair of White-breasted Nuthatches come out of a small cavity in a rotted knothole 5.4 m from the ground in an old elm. The tree was situated on a boulevard which ran parallel to the Assiniboine River and near to an entrance gate to Assiniboine Park in Winnipeg.

This site was visited again 18 May to see if there was any activity around the hole. An adult entered the cavity and came out; it then flew across the road to a giant Chestnut tree. Three days later an adult flew to the hole but did not enter as a plane came overhead and appeared to disturb it. (As male and female are similar it is difficult to distinguish the sexes.) A few minutes later both male and female flew to a branch close to the hole at which time the male gave the female an insect. Stokes states "mate-feeding takes place during courtship and it increases in frequency as nest-building and egg-laying approach, but 'once the young hatch it soon stops.'"[7]

At 1100 h 31 May the two birds took turns entering the cavity. Between entries they busied themselves moving up and down the nearby trees in constant search for food. During the next few days the nest was observed at different times each day and both adults entered the hole — on a few occasions with a cankerworm in their beaks. On 10 June at 1030 h an adult flew near the cavity, perched above it, appeared to dissect a worm, then went into the hole. This time it came out backwards which was unusual.

The nest site was observed every other day to discover when the young would leave. When both parents came with food on 11 June they did not go completely into the hole as previously; this indicated that the young ones were maturing. On 13 June an adult head protruded from the hole but the bird was deterred from coming out by the loud warning calls of a Red-winged Blackbird. The male came with a worm in its beak and gave it to the female at the opening, whereupon the female drew back into the hole.

When an adult flew to the hole 14 June

it could be seen that the young were near the opening. Two days later the adults did not enter the cavity but fed the young at the entrance; some would soon be fledging. (The nestling phase is recorded as 14 days.[7]) Near 1000 h 17 June an adult put only its head and neck into the hole on three trips to feed the young and once a fecal sac was taken out.

Until 16 June both adults flew across the road to obtain insects from large trees there. On 17 June one of the adults flew to a tree 15 m directly behind the nest site. It appeared that some of the young had fledged and were being fed there, but they could not be located. (The fledgling phase may last for about 2 weeks.[7]) Both parents made continuous trips to the nest hole between 1050 and 1100 h on 18 June. At least two young were at the opening. No nuthatches were seen or heard at the site on 19 or 20 June.

Although the entire nesting period was observed in this cavity, the nest site had not been located in time to observe nest-building. This activity was observed at another site in April 1982. The unusual activity commenced outside a larger knothole (with a passageway) 3.6 m up in a giant elm. This cavity opening was larger than that of the 1986 nest and with a crooked entrance. The pair of White-breasted Nuthatches was gathering bits of dried leaves from crevices in tree bark and carrying them into the nest hole. Several times in the following 8 days these adults exhibited the strange behaviour called "bill-sweeping" in which both adults engage in prolonged sweeping of the bill in a wide arc in or outside the cavity.[7] When bill-sweeping the birds seemed occasionally to have an insect in their beak, and then they wiped their bills on the bark; they also proceeded to stuff something into the crevices of the bark around the hole. Although the reason for this behaviour is not known it is believed that these activities "leave a scent that deters squirrels and other mammal predators from the nest area;" this is a territorial defense mechanism.[7] [6]

On 24 April a crow appeared, causing some commotion; it perched on many occasions atop a giant spruce adjacent to the elm containing the cavity. The activity of the nuthatches ceased; presumably they deserted this nest site.

A most fascinating nest was discovered in 1976 in a large cavity 0.6 m from the ground in a deformity of an old giant oak tree in the yard at Whytewold (south end of Lake Winnipeg). On several occasions prior to 21 May a pair of nuthatches had been observed going up and down the bark of this tree. The gnarled cavity (approximately 7.5 cm by 15 cm on the outside) was concealed by slender branches of a dogwood. When the adults began carrying food more frequently I investigated, finding that the only way to see into the cavity was to pull aside a branch of the dogwood at 1630 h each day when a shaft of sunlight penetrated the cavity. On 4 June several fluffy young were visible.

On 8 June a chipmunk was running about on the ground at the base of the nest tree. Both adults, while coming down the tree head first, performed the display known as "wing-spread."[7] They gave this display on the ground as well; this lasted for several minutes while the chipmunk was still in sight on the ground. In wing-spread on a tree trunk the body and the bill are pointed vertically and the wings and tail are fully spread. The bird will either sway slowly back and forth and/or pose in this position; the latter was the case in this display. It is evidently to ward off squirrels and other birds which may compete for the nest holes chosen by nuthatches. Over the next several days food carrying activity increased. On 17 June five nearly fledged young were sitting upright, close together in such as manner as to resemble miniature penguins. This nest afforded an unusual opportunity for observation since "as is the case of most nestling birds reared in a hole in a tree, little is known of the young . . . . . while they are in the nest."[2] By 1000 h the following day several young had fledged after much calling. At 1630 the cavity was empty except for one tiny, dead, naked chick.

Since the White-breasted Nuthatch does not leave our area in winter it is delightful to hear its calls and watch its behaviour throughout the entire year.

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HELPING INJURED WILDLIFE

The **Manitoba Wildlife Rehabilitation Organization** has been established to care for injured or orphaned native wildlife, mainly birds and small mammals. The organization has a 5 acre wooded site in Winnipeg, close to both veterinary services and the city zoo, where it hopes to establish a facility for treatment and release. The demand for this type of facility appears to have been increasing over the past few years. Interested people often run into a dead end in trying to find help for injured wildlife where they lack the expertise, equipment for treatment or the facilities to house them. Finding that facilities do exist can only encourage these people to further their interest in wildlife conservation, and will increase the voice supporting programs such as habitat preservation.

Some MWRO members have been dealing with injured or orphaned wildlife for many years. For example Renate Scriven has been caring for injured wild birds since she was 8 years old. During 1985-1986 she and her parents handled "more than 700 birds, including eagles, hawks, owls, herons, gulls, waterfowl and hummingbirds. About 450 of these were eventually released to the wild."

Those who wish to assist in the establishment and operation of this facility should apply for membership in the organization to **Manitoba Wildlife Rehabilitation Organization, P.O. Box 242, Station "C," Winnipeg, Manitoba, R3M 3S7** or telephone **(204) 888-3094.**

BIRDS OVER BOULDER

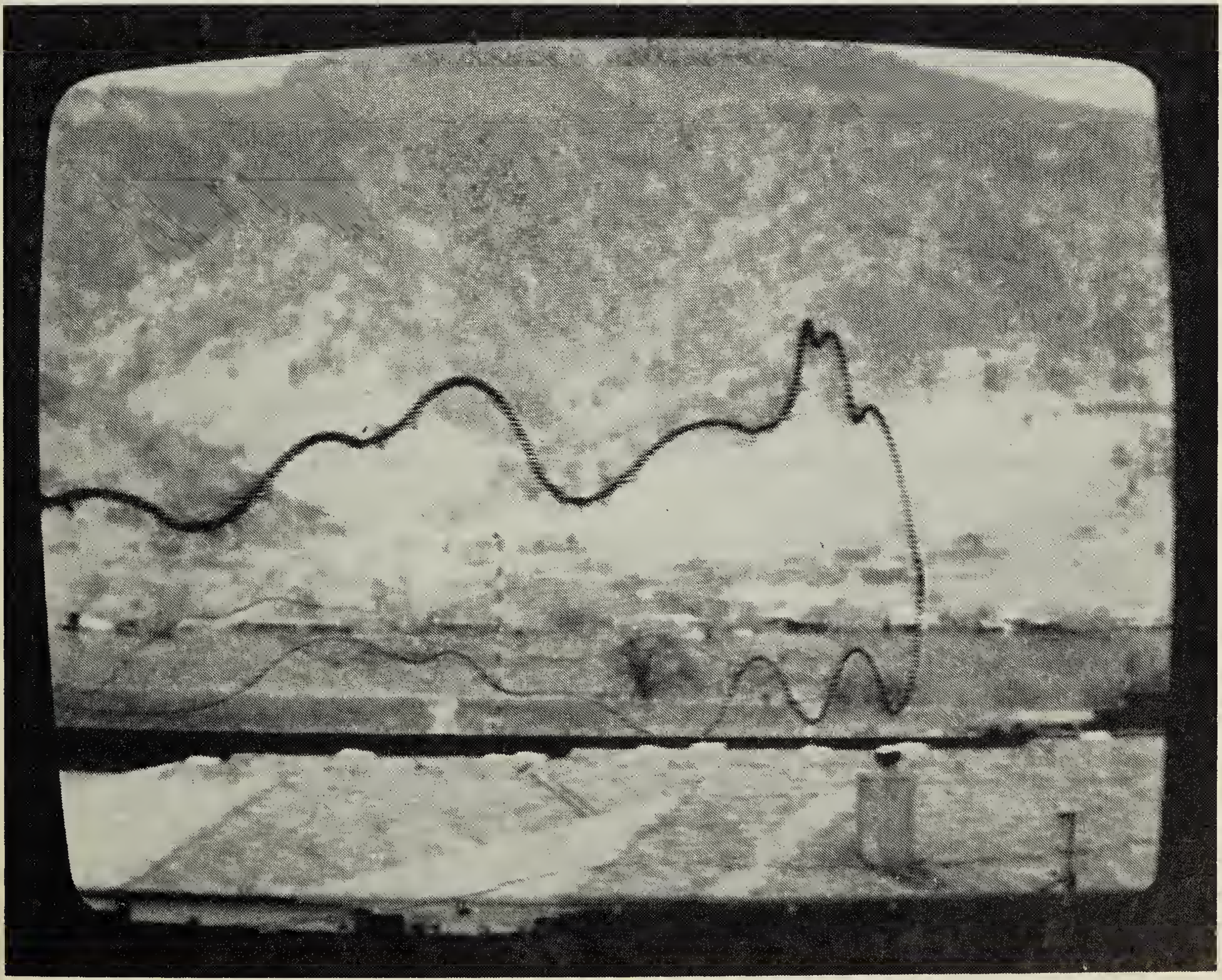
GLEN SOUTHWORTH, Colorado Video Inc, Box 928, Boulder, Colorado. 80306

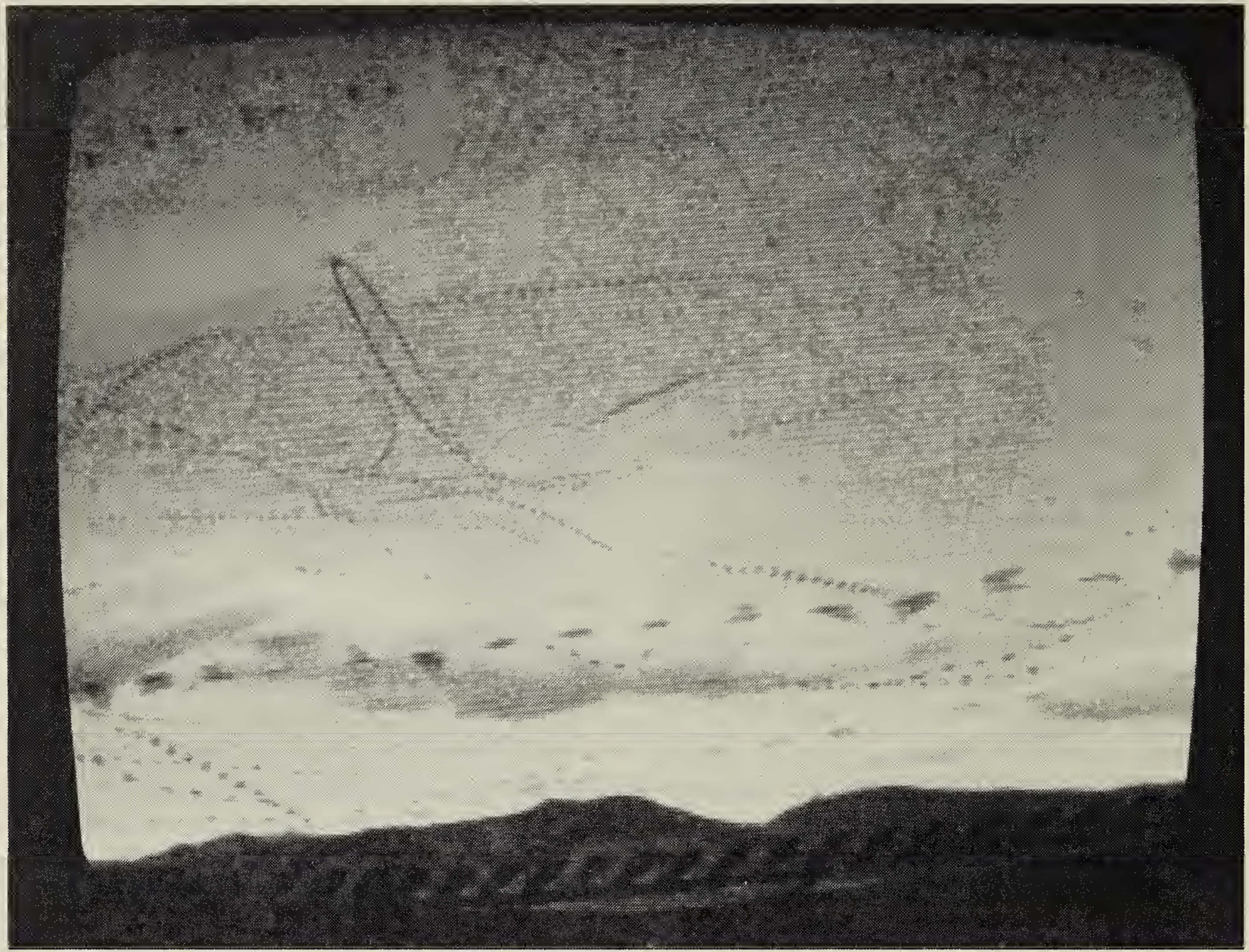
An unusual 20 minute time exposure using advanced video techniques allows observation of flight patterns and other activity of birds in a suburban location of Boulder, Colorado. The television system used is unique in that it may be used in broad daylight to accumulate informtion in a single composite image over an extended period of time.

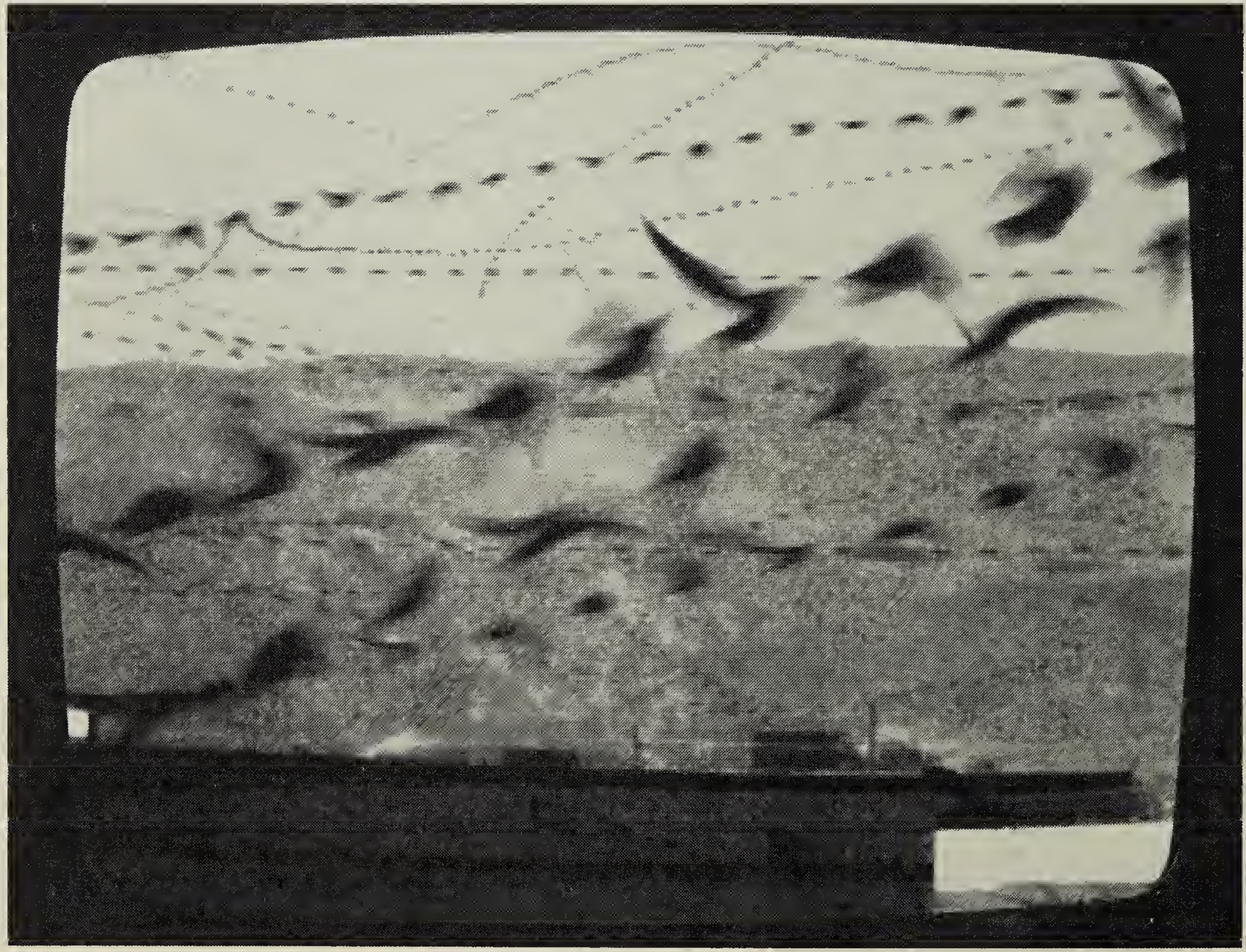
A high quality, solid state, television camera producing a conventional video signal was first focused on an area of anticipated bird activity. The output of the camera was then fed to a special digital video "memory" which initially "freezes" a picture of the scene and then continues to add new information to the original background. The resulting image was then displayed on a TV monitor and photographed.

While conventional photographic film records only light, the video "memory" was set to continuously capture objects darker than the original image, thus providing a capability previously unavailable in research. The special video system may also be used to provide "time exposures" of subject lighter than the background, and has proven to be useful in the daytime observation of lightning strokes.

At present this unusual means of extending human perception seems like a classic case of a solution looking for a problem! Suggestions anyone?







THE BLACK-TAILED PRAIRIE DOG IN SASKATCHEWAN

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The Black-tailed Prairie Dog is one of five species of prairie dogs that historically ranged throughout much of the Great Plains Physiographic Zone. Black-tails are the only species of prairie dog currently found in Canada and are restricted to an area in southern Saskatchewan near the town of Val Marie. Prairie dogs have occupied native grasslands in Saskatchewan since at least the early 1900s but have been unable to colonize other areas. Because of their restricted distribution, prairie dogs have been classified as a "rare" species by the Committee On the Status of Endangered Wildlife in Canada (COSEWIC). Parks Canada has also recognized their uniqueness and included the majority of the Saskatchewan colonies within the area proposed as Grasslands National Park.

Colony Distribution and Size

Despite their classification as rare, as well as being an interesting and relatively easy species to study, prairie dogs have never been intensely studied in Canada. Accurate information on the distribution of prairie dogs in Saskatchewan is available from only three studies. Colonies were mapped in 1970, 1975 and 1985. The 1970 study was conducted specifically to determine the distribution and abundance of prairie dog colonies. In 1975 and 1985 colonies were mapped as part of feasibility studies conducted to determine the suitability of Grasslands National Park as a re-introduction site for Black-footed Ferrets.

In 1970, 15 colonies totalling 503 ha were located. By 1975, the number of

The Black-tailed Prairie Dog *Juhachi Asai* prairie dog colonies decreased to 13, but the total occupied area increased to 763 ha (Table 1).[5] Ten of these colonies, totalling 723 ha, were within the proposed Grasslands National Park boundary. Between 1970 and 1975, the total area of prairie dog occupied habitat increased by 52%.[5] Average colony size increased from 33.5 ha in 1970 to 58.6 ha in 1975.

In 1985, 14 prairie dog colonies were located. They averaged 48.9 ha in size and totalled 684.5 ha (Figure 1). Only the colonies within the proposed park boundary were accurately mapped. The area of the two colonies located outside the boundary was estimated by visual inspection. Despite receiving protection under the Provincial Wildlife Act in 1981, there was a decrease of approximately 78 ha or 10% in total prairie dog occupied area between 1975 and 1985. Three colonies (Colonies B, I and J) decreased significantly in size with Colony B showing the greatest decline. In 1981, a major part of this colony was cultivated, destroying the habitat for prairie dogs (F. Perrault, pers. comm.). Colonies I and J decreased in size by approximately 50% for unknown reasons. Despite legal protection for prairie dogs, illegal controls could still be affecting colony expansion. Spent shells were found in several colonies, however, they were not common and probably represented only a minor influencing factor. The poisoning of prairie dogs could explain the decrease in size of some colonies but no physical evidence of poisoning was found. Significant increases in Colony 0 and Q suggest that climatic factors were not responsible for decreases in Colony I and J.

Prairie Dog Density

Prairie dog density was not determined in 1975 or 1985. Guidelines for estimating prairie dog population size using visual counts have been developed from research in the United States. The visual count method provides a reliable and inexpensive censusing technique and is highly recommended to estimate prairie dog density in Saskatchewan. Accurate prairie dog density estimates require site

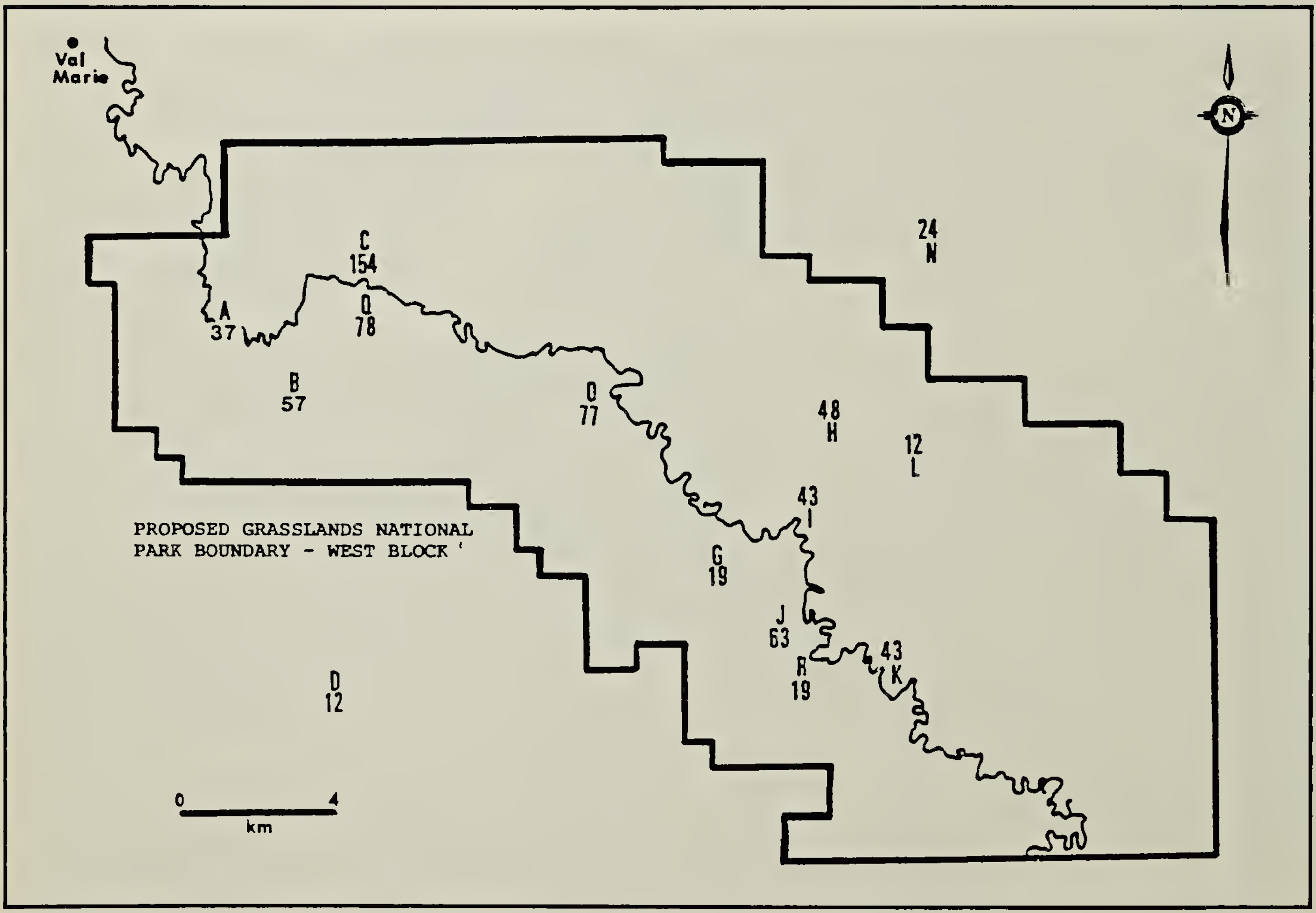

Figure 1. *Location and size (ha) of prairie dog colonies in Saskatchewan in 1985.*

TABLE 1. SIZE OF SASKATCHEWAN PRAIRIE DOG COLONIES IN 1970, 1975 AND 1985.*

COLONY	*SIZE 1970*[7]	*SIZE 1975*[5]	*SIZE 1985*[4]
A	30.3	31	37
B	103	254	57
C	0.6	164	154
D	2	8	12
E	0.4	NL	NL
F	0.8	NL	NL
G	34.3	17.6	19
H	53.7	40	48
I	44.4	80	43
J	92.9	120	63
K	0.4	7.2	43
L	18.2	4	EST 12
M	0.2	NL	NL
N	121.2	24	EST 24
O	0.4	4.4	77
P	-	8.8	NL
Q	-	-	78
R	-	-	19.5
TOTAL	503	763	684.5
MEAN	33.5	58.6	48.9

* Area in hectares. NL-not located EST-area estimated

[4] Laing 1986

[7] Kerwin and Scheelhaase 1971 cited in Millson 1976.[5]

specific analysis. Large density variations have been found between regions and between colonies within regions.

Summary

In 1975 Millson identified approximately 5800 ha of potential prairie dog habitat, most of which was within the proposed park.[5] Given the availability of suitable habitat, the 52% increase in total prairie dog occupied area between 1970 and 1975, and the fact that prairie dogs received legal protection under the Wildlife Act in 1981, an increase in total occupied area was expected in 1985. While the number of colonies did increase, there was a net decline in total occupied area. The major reason for the decline was habitat loss due to cultivation. Other potential factors influencing prairie dog expansion include: drought, overgrazing, and poisoning.

Despite the net loss of occupied area, Black-tailed Prairie Dogs are not in any immediate danger of becoming threatened or endangered. The loss is of concern, but has not yet jeopardized prairie dogs in Saskatchewan. The primary concern is that several colonies occur on privately owned land where they are vulnerable to land-use change. Cultivation of native grasslands, and poisoning programs were historically responsible for greatly reducing and segmenting prairie dog colonies. Additional habitat losses would reduce the viability of prairie dogs in Saskatchewan. Legislation to protect Saskatchewan's prairie dogs from human land-use practices is recommended. This may require compensation to land owners. Studies in the United States have shown that there is a small economic loss to ranchers as prairie dogs compete with cattle for forage.[6]

Establishment of the Grasslands National Park should ensure the long-term survival of prairie dogs. National park legislation will protect prairie dogs and their habitat from poisoning, shooting and severe land alterations. Prairie dogs will very likely become popular with park visitors and add to their enjoyment and understanding of the complex and fascinating prairie ecosystem.

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HOUSE SPARROW KILLED BY RED SQUIRREL

ROBERT W. NERO, Wildlife Branch, 1495 St. James Street, Winnipeg, Manitoba. R3H 0W9

Although the Red Squirrel's carnivorous reputation was known to me, it was still a surprise to see one capture and run off with a House Sparrow. This happened at a bird feeder in our Winnipeg yard at 1:15 p.m., 25 July 1987. It was a bright, hot day. My wife, our son Birch, and I were relaxing in the shade 9 m from about 20 House Sparrows feeding close together on the lawn beneath the feeder which is fastened about 1 m high on a large Bur Oak. I had been casually watching the sparrows, particularly one with several white wing feathers. Suddenly, a squirrel ran up the tree with a sparrow hanging upside down in its mouth, followed by a flock of scolding sparrows. When we got to the tree the squirrel was perched on a limb about 4.6 m up, where it killed the sparrow. Alarmed by us, the squirrel left the sparrow on a limb and ran about 3 m higher. It returned shortly, retrieved the sparrow and carried it back up to the higher position. Then it left the bird and raced about the tree seeking to escape to adjacent trees. It was an adult, lactating female, presumably with young in some other yard.

The sparrow, a juvenile male weighing 25 gm, had deep lacerations on the left breast and right abdomen. It appeared to have no other injuries. Inexperienced and busily seeking food, it had apparently been taken by a surprise attack by the squirrel from around the base of the tree. This feeder regularly attracts both squirrels and several species of birds. The birds feed in the tray of the feeder as well as on the ground beneath. Often, they may be seen feeding on the ground at the same time that squirrels are in the feeder. Thus, there have been many opportunities to observe squirrel-bird interactions. Red

Squirrels and House Sparrows have been using this feeding site for the past 15 years, summer and winter, but we have not previously seen a squirrel even attempt to catch a bird. Presumably the squirrel's drive was based on a need to feed young. However sunflower seeds were almost constantly available at the feeder. Moreover, over the past few years at least five families of Red Squirrels have fed here. Earlier this year one family came out of a cavity in a dead Trembling Aspen not more than 4.6 m (15 ft.) from the feeder. It may, in fact have been the same female that caught the sparrow. An hour and a half after the capture, what was apparently the same squirrel was in the feeder, eating sunflower seeds.

This squirrel's carnivorous habits were briefly noted by Pylypec "only in the spring and early summer," but Sealy successfully trapped them in winter near Battleford, Saskatchewan, using meat for bait.[8] [9] Nearly every account of the Red Squirrels' life history mentions its habit of preying on the contents of birds' nests and fledglings.[1] [2] [3] [4] [5] [6] [7] Even larger prey may be taken. Hamilton reported that they also killed young Eastern Cottontails and young Grey Squirrels. Banfield writes: "The red squirrel is far more carnivorous than the other tree squirrels and will eat practically anything it can catch that will not eat it. It has been known to eat deer mice, meadow voles, young cottontails, robins, bluebirds, orioles and ruffed grouse. One boldly entered a cavity occupied by a sawwhet owl and ate the cached mice."[1] A cautionary note is raised by Cahalane: "The practice of nest robbing cannot be very general. Birds often have been known to rear their broods in the same trees with red squirrels, while the latter looked on and showed no gustatory interest. Some red squirrels have been terrorized by jays and robins, that never permitted the rodents to approach their nesting sites."[2] Klugh, an early student of the Red Squirrel summed up his views as follows: "It is probable that only certain red squirrels are bird-eaters, just as only certain tigers are man-eaters and such individuals should be destroyed as soon as evidence against them is obtained."[6] For the time being, at least, I plan to keep a close eye on the squirrels in our yard!

Red Squirrel *Frank Switzer*

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NATURE LIBRARY

BUMBLE BEES OF SASKATCHEWAN (HYMENOPTERA: APIDAE) A SURVEY OF THEIR GEOGRAPHIC DISTRIBUTION

PHILIP S. CURRY 1984. Natural History Contributions, Number 5, Museum of Natural History, Saskatchewan Department of Culture and Recreation, Regina. 44 pp. Free.

Did you ever wonder whether or not you were seeing more than one kind of bumble bee during your summer outings or when you were working on the flower beds in the back yard? Did you ever speculate that there might be more than one kind? There are 21 species of bumble bees in Saskatchewan whose distributions are ably described by Phil Curry in this publication.

The introduction to this booklet includes brief descriptions of the distribution of bumble bees in North America, the biology of *Bombus* and *Psithyrus* (the two genera found in Saskatchewan) and the mapping of insect ranges. Other major sections describe methods of mapping of these bees, the geographic distribution of the bees by vegetative zones, and a key which emphasizes colour as an aid in the identification of the two genera and 21 species. There are also three appendices which include 21 distribution maps, site collection records, and a glossary of anatomical terms. Two illustrations in the text depict the vegetation zones of Saskatchewan and the anatomical parts of the bee for identifying it to species.

The booklet is well written but suffers from several minor problems. An essential anatomical term, the *interalar area*, is not included in the figure of body parts, therefore reducing the effectiveness of the key. Additional life history material from sources such as *Bumblebee Economics* by Bernd Heinrich or *The Insect Societies* by E.O. Wilson could be included without detracting from the major intent of the publication, which is the geographic distribution of bumble bees in Saskatchewan. The maps with their external trappings would be more attractive without the grid and underlining. Also, the categories, *common name, synonymy* and *food*, with no information could have been deleted from the maps.

This booklet is an excellent contribution to the entomological record of Saskatchewan. It should be a valuable reference to both the amateur and professional entomologist interested in identifying bumble bees and learning the distribution in Saskatchewan. — Reviewed by *E.A. Driver*, Canadian Wildlife Service, Saskatoon, Saskatchewan. S7N 0X4

LETTERS

BIRDWATCHING AT BOWERS DRIVE

As an inexperienced bird watcher the statement that these do not seem to be many birds in an area could mean that the sightings of the observer have been inconsistent. As the trees mature in a new development so I feel sure have the numbers of birds [increased]. I am usually on the lookout for them but have never overcome the fear of being caught peering through binoculars by my neighbours. I find the identification of birds quite frustrating at times when I am unable to decide the species in question. I will not name a bird unless I am convinced of its identity.

Above is a list of the birds I have seen in my garden in the past year with a few stretching across Territorial Drive.

I will comment on some of them. But for the House Sparrow there are times when the garden would be devoid of birds, and I welcome them for this reason. However bad the weather they are the survivors, but at the feeder their manners are dreadful, for they sit there monopolizing the small space, scattering the feed all over the place.

I love the chickadee for the cutest of ways and well mannered feeding, never eating at the feeder, but taking each seed to the same twig where it is skillfully shelled out and eaten.

A little lamb suet will often attract a woodpecker and I have had a little Downy visiting on the coldest of days working on a piece of flimsy fat. Individual birds give me the most pleasure, but I have to admit that I am thrilled to witness the presence of huge flocks of Bohemian Waxwings cleaning off the Mountain Ash berries. Later on during the winter they return in small numbers to clean up those berries which are exposed as the snow melts beneath the trees. The weather has usually turned very cold when they first arrive, although I have witnessed huge droves of migratory Robins get all the berries first.

I love juncos as I do chickadees, because of the way they forage among the leaves, scratching back like a chicken does. I have seen juncos in October with a beak full of hairs as if the nesting habit was hard to break. These Slate-colored Juncos are a dainty bird and a joy to see as the white in the tail is exposed in flight. They seem to stay for only a short time during cold days of spring and fall.

Of the spring arrivals the North American Robin is a favourite of mine; that is the ones which stay in our gardens and have their nests nearby. I like their worm searching habits, as they run, stop to listen and then jab at a worm. Mostly they are successful. They frequent the bird

Bohemian Waxwing *Lawrence Baschak*

bath too, and are a pleasure to watch taking their ablutions, followed by flight to a fence to preen and dry off. Their young ones stay with us until they leave in the fall.

The arrival of the swallows means warm weather and lots of insects upon which to feed, their presence reducing the many mosquitos. I think these must be Barn Swallows. Their flight patterns interest me most with their capacity for speed and manoeuverability. The feeding of young is interesting as they line the eaves awaiting their turn and jostling for position. The parent seems to know whose turn it is for the next feed. Some greedy youngster will meet the parent in flight, but usually misses out. In the fall I watch them anxiously, their departure signifying cooler weather and fewer insects.

I think I have Chipping Sparrows, at least they chip. They too, have dainty habits as they search the grass for insects, staying with us through spring and summer, with nests nearby no doubt.

I have no meadowlarks of course, but I do have them on my walk to Broley's Corner [neighbour]. They delight me with their song of hope and I know where to look for them on the power poles. They have an in flight call like a sigh. They seem most conscious of territory. On my travels south they are to be heard at intervals right through the country.

Cedar Waxwings have been active since the pin cherries have been ripe, feeding on them long before resorting to the Mountain Ash berries. Most years I have been aware of a few Cedar Waxwings, but this year they came in hundreds, but appear to be immature, lacking streaking on breast and below, being comparatively plain grey to white in colour. Their behaviour due to numbers was different from previous years when they seemed to be sheltering from stormy weather. They behaved in quite a drunken fashion having started in on the Mountain Ash berries earlier than usual compared with their cousins the Bohemian Waxwings and of course there were the usual window casualties due to drunken flying. Their insect catching antics are interesting, since they can fly straight up from a hovering position. They were here in September, but seem to have moved on.

Warblers came in large numbers this year but, owing to their quick-moving habits and remaining only briefly in one spot, I have been unable to identify them. I did notice olive coloured plumage on some. They seemed to be picking insects from the branches of the Manchurian Elms, also making rapid flight to the next door pine tree where cover is good.

In early spring I have heard, and caught glimpses of a couple of Baltimore Orioles, but they don't seem to stay. However, during the 15 May snow storm one perched on the ash tree outside the kitchen window and was kind enough to stay while I got a snapshot of him. He seemed most disorientated by the weather and kept returning to the same twig on the same branch. Evening Grosbeaks are conspicuous by their absence around here, although I have seen the lone female. In Nipawin they were so plentiful in the very cold weather.

Starlings are occasional visitors, feeding on low weeds around the edge of lawns. I always look on them as rather vulgar, greedy birds.

I found a dead sparrow near my picture window where two Cedar Waxwings had met their deaths. It was quite different from House Sparrows, having a central breast spot of black on its whitish breast and had a rounded tail. The top of the head had a definite pattern of black and brown. Chin to tail was white, no special markings. I compared it with a western race Fox Sparrow.

Seen and heard from a distance are ducks and geese, crows, the odd magpie, gulls and terns and killdeer. The gulls are most conspicuous after a rain when they sweep down the streets apparently looking for stranded worms.

The sound of geese overhead never fails to cause me to pause and look up, while taking in the haunting sound.

All of a sudden one says or hears someone say that the crows are back, and somehow I feel glad although they don't greatly interest me. In the fall they are seen to congregate, and all too soon they are gone.

At the bottom of my road at the corner of Bowers Drive and 19th Avenue was once a run, extending out across Territorial Drive to a slough surrounded by thick scrubby trees and very often in the spring can be heard the saucy quack, quack, quack of ducks.

Several years ago, before the Territorial Bypass was completed and the waste ground boasted a gravel pit patch of water, one day in early spring before the youngsters were out on their motorbikes, I had the great fortune to find a beaver which had come from the slough and was setting up residence in the pond. I sat on the high bank and watched for some time. I knew I might not see him again because of people. He was gone the next visit I paid to the pond. Later the pond was filled, the ground levelled and seeded to grass. Now there is no hill for kids to toboggan down, but residents are placated because the pond attracted mosquitos, although the slough on the farmer's field must yield as many as before. —*John M. Hickley*, 1903 Bowers Drive, North Battleford, Saskatchewan. S9A 3B9

CROWS AND OWLS

On 17 April 1987 I was driving on a country road in the Rock Point district near Lucky Lake, Saskatchewan. A flock of crows was causing a commotion in a large poplar located on an abandoned farmstead. I drove into the yard to investigate. When I walked across the yard and through a small shelter belt a Great Horned Owl flew down from a poplar tree and passed very close (too close) to my uncovered head causing a few hasty steps in retreat. A nest containing three young owls was seen approximately 2.2 m above ground on a rotted poplar stump. I stayed about 30 minutes, and although the adult owls gave an occasional hoo hoo, and snapped their beaks, they did not seem to mind my presence nearly as much as that of the crows, who continually harassed them. I strongly suspect the crows would have killed the young owls had the parents not been close by.

On 20 April the crows were still making life miserable for the owls. Owl pellets found in the area indicated the owls were hunting successfully at night. — *Myron Barton*, R.R. 5, Site 16, Box 51, Prince Albert, Saskatchewan. S6V 5R3

MORE HUMMINGBIRD— SAPSUCKER INTERACTIONS

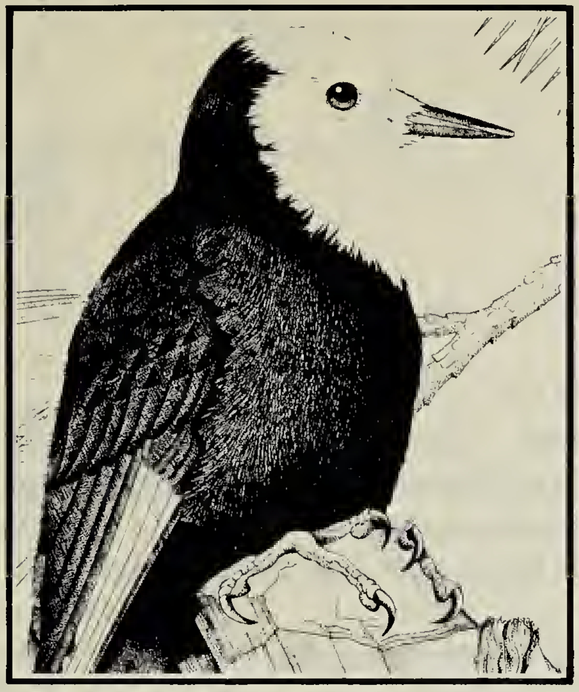
We were very interested in the article *Ruby-throated Hummingbird associating with a foraging Hairy Woodpecker* (Dec 86 Blue Jay) as the same thing has been happening in our farm yard for the past three years.

Our bird was a Yellow-bellied Sapsucker and one or two Ruby-throated Hummers would leave the feeder when this bird came to the Maple or Dropmore Elm trees close by; they would wait patiently on the branch until it decided to go to another tree, then they would feed on the sap drips made by the sapsucker.

We covered the markings made by the sapsucker with cloth and we often observed the hummingbirds feeding on the cloth as it became damp with the sap.

After we discouraged the sapsucker, the hummingbirds returned to the feeder but if a sapsucker should appear they immediately followed it to whatever tree it went.

This we felt was a usual occurence after having observed it so many times in the years we have been feeding hummingbirds. — *Mildred* and *Jim Spear*, Box 914, Russell, Manitoba. R0J 1W0



BIRDS

of the Okanagan Valley, British Columbia

by **ROBERT A. CANNINGS, RICHARD J. CANNINGS,** and **SYDNEY G. CANNINGS**

Published by the Royal British Columbia Museum, Victoria, B.C., Canada

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